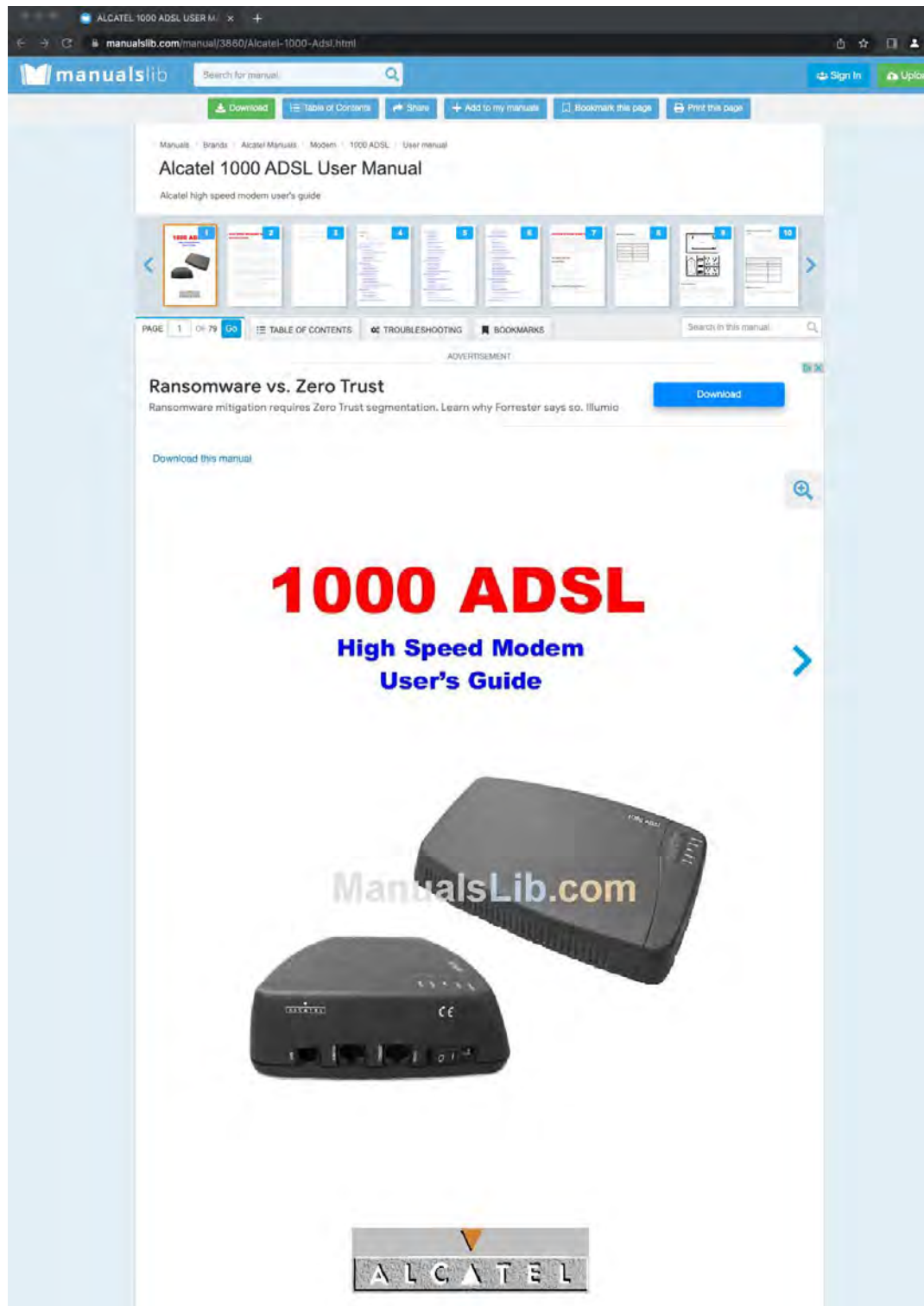


EXHIBIT O

Alcatel A1000



<https://www.manualslib.com/manual/3860/Alcatel-1000-Adsl.html> (accessed April 13, 2022)

1000 ADSL

High Speed Modem User's Guide



SAVE THESE IMPORTANT SAFETY INSTRUCTIONS!

1. Read and understand all instructions.
2. Follow all warnings and instructions marked on the product.
3. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not use this product near water; for example, near a bath tub, wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool.
5. This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your dealer or local power company.
6. Do not allow anything to rest on the power cord. Do not locate this product where the cord will be abused by persons walking on it.
7. Do not overload wall outlets and extension cords, as this can result in the risk of fire or electric shock.
8. To reduce the risk of electric shock, **do not disassemble this product**, but **take it to a qualified serviceman** when service or repair work is required. Opening or removing covers may expose you to dangerous voltages or other risks. Incorrect reassembly can cause electric shock when the appliance is subsequently used.
9. Unplug this product from the wall outlet and **refer servicing to qualified service personnel** under the following conditions:
 - When the power supply cord or plug is damaged or frayed;
 - If liquid has been spilled into the product;
 - If the product has been exposed to rain or water;
 - If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions; improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation;

- If the product has been dropped or the housing has been damaged;
 - If the product exhibits a distinct change in performance.
10. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
 11. Do not use the telephone to report a gas leak in the vicinity of the leak.

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SECTION 1: QUICK START PROCEDURES

This section of the 1000 ADSL High Speed Modem User's Guide provides the basic instructions to install your modem and access online services as quickly as possible. Procedures include steps for correct placement of your modem, cable connections, and switching on the modem. These quick start procedures assume a single PC configuration using the modem's default settings.

A detailed description of features is provided in section 2 of this user's guide. Section 2 also provides a description of advanced configurations used in small office environments. Because the Alcatel high speed modem provides a user interface to your PC, you can change default settings of the modem to accommodate specific networking requirements.

GETTING STARTED

Delivery Check

Verify that the Alcatel 1000 High Speed Modem box contains all the components listed below:

- ADSL high speed modem,
- Power supply adapter with connecting cable,
- Alcatel Data Cable (Category 5)
- Wall-mounting template,
- Two wall plugs and two screws for wall-mounting option, and
- This user's guide.

Placement of ADSL High Speed Modem

The ADSL high speed modem may be placed on an even, hard surface, such as a desk, or mounted on a wall. In either case, make sure the modem is near a power outlet, phone jack, and the PC to facilitate connections to these devices.

Wall-Mounting Option

Part of the packaging is a wall-mounting template. If you want to mount the modem on a wall, cut the template out and use it as follows (see figure 1).

1. Use template to mark positions of holes as indicated in table A.

Table A.	
If you mount the modem on...	Mark positions of holes
Left side of corner	A1 and A2
Right side of corner	B1 and B2
Area of wall away from corner	Either A1 and A2 or B1 and B2

2. Drill the marked holes with a 6-mm (0.24-in.) diameter drill bit to a minimum depth of 35 mm (1.38 in.).
3. Insert the wall plugs in the drilled holes.
4. Insert the screws in the wall plugs and tighten them, leaving at least 3 mm (0.12 in.) protruding.
5. Position the modem over the upper screw (A1 or B1) and pull the box down until you hear a click.
6. Rotate the modem toward the lower screw (A2 or B2) and push it until you hear a click.

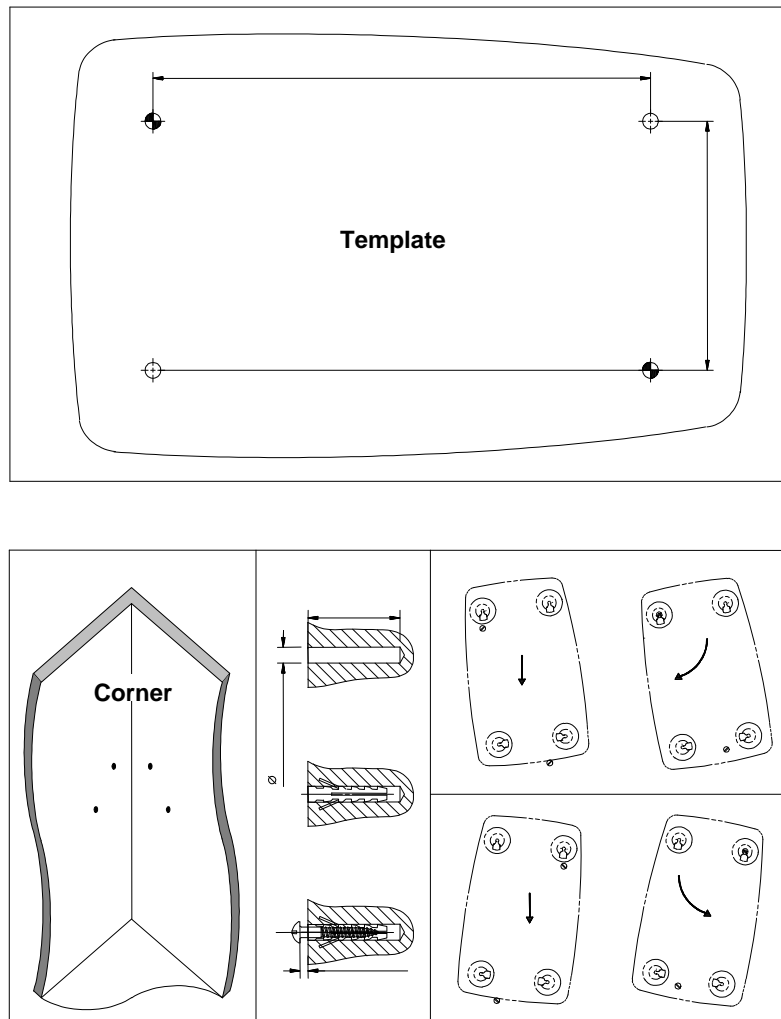


Figure 1. Wall-Mounting Instructions

Filter Installation

To maintain normal phone service, a special filter must be installed in the Network Interface Device or NID, the gray box mounted on the outside of your home that terminates your phone connection. This filter, sometimes called a splitter, splits the voice (phone) signal from the ADSL (data) signal.

Set-up and installation charges for ADSL service typically include the filter installation. If you are not sure that the filter is installed, contact your service provider.

Determining Your Service Type

Note:

Before continuing, you must know the type of service you are being provided. If you do not know your service type, contact your service provider for this information. Your service type is one of the following:

- Bridged Service (RFC 1483) [with or without filtering]
- Point To Point Service (PPP)
- ATM-25 Service (ATMF)

The ADSL modem is available in various models. The model must support the type of service you are being provided. Table B lists the model numbers and the types of service supported. The model number is on the bottom of the modem.

Table B.	
Service Type	Model Number
ATM-25 Service (ATMF)	3EC 18200 AB
Bridged Service (RFC 1483)	3EC 18202 AB
Bridged Service (RFC 1483) Point To Point Service (PPP)	3EC 18202 BB
Bridged Service (RFC 1483) with Filtering Point To Point Service (PPP)	3EC 18202 DB

BRIDGED SERVICE

If your service provider is providing bridged service, your ADSL modem should have model number **3EC 18202 AB**, **3EC 18202 BB**, or **3EC 18202 DB** on the bottom of the modem case.

System Requirements

The Alcatel 1000 ADSL high speed modem requires a PC or workstation equipped with an Ethernet 10Base-T network adapter card.

Note:

Before you begin, you will need to ask your service provider whether your connection will use static addressing, or DHCP (dynamic) addressing. You will need this information at step 9.

Hardware Installation

To connect your high speed ADSL modem, follow these steps:

1. **Make sure the modem on/off switch is set to the O (off) position.**
2. Connect the jack end of the power cable to the modem power socket.
3. Plug the other end of the power cable (the end with the power supply adapter) to an electrical outlet.
4. Connect one end of a standard telephone cable (not provided) to the modem connector labeled LINE.

Note:

The line cable may be provided by your service provider during installation, or it can be purchased at your local electronics supply store.

5. Connect the other end of the line cable to a phone jack.
6. Connect one end of the Alcatel Data Cable (provided) to the modem connector labeled 10BASE-T.
7. Connect the other end of the Alcatel Data Cable to the Ethernet 10Base-T network adapter card in your PC.
8. Start your PC.
9. Click **Start, Settings, Control Panel**, and finally, the **Network** icon.
10. Click the **Configuration** tab.
11. Scroll down to the TCP/IP protocol adapters, find the adapter which includes the name of your Ethernet card, and select it.
12. Click the **Properties** button.

13. When the **TCP/IP Properties** window appears, click the **IP Address** tab.
14. If your service is DHCP, click the **Obtain an IP address automatically** radio button. If your service uses static addressing, press the **Enter IP address** radio button, and enter the IP address and subnet mask assigned to you by your service provider.
15. Restart your computer.
16. Turn on the modem by switching the on/off switch to |.

Power/Sync Light

The **Power/Sync** light begins blinking. After about two minutes, the light should be solid green. If the light is not solid green, check the telephone line cable between the modem LINE connector and the phone jack. If this connection is secure and the **Power/Sync** light is not solid green, contact your service provider for assistance.

10BASE-T Light

The 10BASE-T light should be solid green. If the light is not solid green, check the Alcatel Data Cable connection between the modem 10BASE-T connector and the Ethernet 10Base-T network adapter card in your PC. If this connection is secure and the 10BASE-T light is not solid green, contact your service provider for assistance.

Accessing Online Services

When your PC is started and your ADSL modem is switched on, a connection is automatically established with your online service. Through this connection, you can access the World Wide Web or your corporate network or other online services.

Network Address Assignments

Network addresses are either manually assigned (static addresses) or dynamically assigned. If the address is fixed, your PC must be configured with an IP address provided by your service provider. If the address is dynamic, your PC must be configured to use dynamic host configuration protocol (DHCP).

If you are not sure which network addressing method you are using, ask your service provider for this information.

POINT TO POINT SERVICE

If your service provider is providing point to point (PPP) service, your ADSL modem should have model number **3EC 18202 BB** or **3EC 18202 DB** on the bottom of the modem case.

System Requirements

The Alcatel 1000 ADSL high speed modem requires a PC or workstation equipped with the following:

1. Ethernet 10Base-T network adapter card,
2. Operating system such as Windows 95, Windows 98, or Windows NT (see note)
3. Microsoft Virtual Private network (VPN) Adapter

Note:

If you have an operating system other than Windows 95, Windows 98, or Windows NT, contact your service provider for additional system requirements.

PPP service requires a user account to the service provider of your choice.

Hardware Installation

To connect your high speed ADSL modem, follow these steps:

1. **Make sure the modem on/off switch is set to the O (off) position.**
2. Connect the jack end of the power cable to the modem power socket.
3. Plug the other end of the power cable (the end with the power supply adapter) to an electrical outlet.
4. Connect one end of a standard telephone cable (not provided) to the modem connector labeled LINE.

Note:

The line cable may be provided by your service provider during installation, or it can be purchased at your local electronics supply store.

5. Connect the other end of the line cable to a phone jack.

6. Connect one end of the Alcatel Data Cable (provided) to the modem connector labeled 10BASE-T.
7. Connect the other end of the Alcatel Data Cable to the Ethernet 10Base-T network adapter card in your PC.
8. Start your PC.
9. Click **Start, Settings, Control Panel**, and finally, the **Network** icon.
10. Click the **Configuration** tab.
11. Scroll down to the TCP/IP protocol adapters, find the adapter which includes the name of your Ethernet card, and select it.
12. Click the **Properties** button.
13. When the **TCP/IP Properties** window appears, click the **IP Address** tab.
14. Press the **Specify IP address** radio button, and enter the IP address and subnet mask assigned to you by your service provider.
15. Restart your PC.
16. Turn on the modem by switching the on/off switch to |.

Power/Sync Light

The **Power/Sync** light begins blinking. After about two minutes, the light should be solid green. If the light is not solid green, check the telephone line cable between the modem LINE connector and the phone jack. If this connection is secure and the **Power/Sync** light is not solid green, contact your service provider for assistance.

10BASE-T Light

The 10BASE-T light should be solid green. If the light is not solid green, check the Alcatel Data Cable connection between the modem 10BASE-T connector and the Ethernet 10Base-T network adapter card in your PC. If this connection is secure and the 10BASE-T light is not solid green, contact your service provider for assistance.

Accessing Online Services

To access online services, you must dial-up your service provider. The procedure to use depends on the operating system of your PC. Procedures are provided for Windows 95, Windows 98, and Windows NT.

Windows 95/Windows 98 Dial-Up Procedures

The dial-up feature is not included in the Windows 95 operating system. It can be downloaded without cost from the Microsoft web site <http://www.microsoft.com> or obtained through other software distribution sources. Procedures for downloading and installing this software are provided next.

Downloading Dial-Up Networking Software Upgrade (Windows 95 Only)

To download the Windows Dial-Up Networking 1.3 Performance and Security Upgrade for Windows 95:

1. Access the Microsoft website at <http://www.microsoft.com>.
2. In the **Contents** frame, select **Free Downloads**.
3. Scroll to **Support Drivers, Patches and Service Packs** and select **Windows95 Updates**. The **Microsoft Windows95 Downloads** page appears.
4. Select **Windows 95** in the **Select a product or feature** box.
5. Select **Networking & Communications** in the **Select a category** box.
6. Click **Go**. The **Windows Dial-Up Networking 1.3 Performance and Security Upgrade for Windows 95** is listed.
7. Click this hyperlink to access the **Windows Dial-Up Networking 1.3 Performance and Security Upgrade for Windows 95** page.
8. Click the **Download Now** hyperlink in the upper right corner of the page. The **MSDUN1.3** download page appears.
9. Click the link to a site near you. The program prompts you for a directory to download the msdun13.exe file.
10. Specify a directory. The **msdun13.exe** file is downloaded to this directory.

Installing Dial-Up Networking Software (Windows 95 Only)

The Dial-Up Networking 1.3 Performance & Security Upgrade (MSDUN13.exe) must be installed to setup a dial-up connection to your corporate headquarters or your ISP.

Note:

During the installation, you will be asked to restart your workstation. Make sure you save your work and exit from all applications (except Internet Explorer) before beginning the installation.

Note:

If you installed Windows 95 from a CD, have the Windows 95 CD ready before you begin the installation.

To install the MSDUN13.exe file, proceed as follows:

1. At your desktop, click **Start**, and select **Run** from the menu. The **Run** window appears.
2. Specify the path for the MSDUN13.exe file in the **Open** box and click **OK**.

This will install Microsoft Dial-Up Networking 1.3 for Windows 95. Do you wish to continue?

3. Click **Yes**. The End-User License Agreement window appears. This license agreement must be accepted to start the installation.
4. Click **Yes**.

During the installation, you will be prompted to restart the workstation twice. After restarting, the installer will rebuild your driver twice, once for Dial-Up-Networking and once to enable virtual private networking. This is normal.

Note:

Setup may notify you of a version conflict and ask if you want to keep an original newer file. If this happens, click Yes (always save the newer file).

When the installation is complete, the Microsoft VPN Adapter is added to the list of devices in the **Make New Connection** window.

Installing Dial-Up Networking Software (Windows 98 Only)

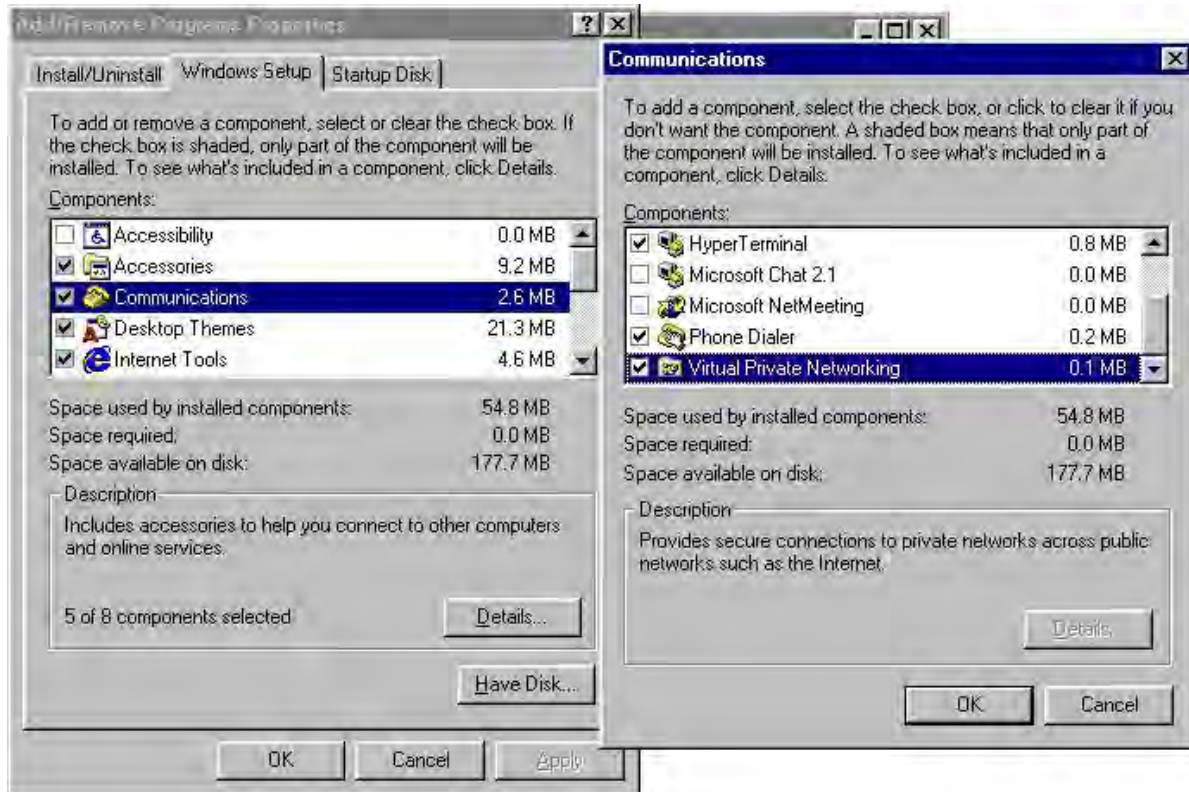
To check whether VPN is installed:

1. Select **Start, Settings, Control Panel, Network**.
2. Select the **Configuration** tab. On the Configuration list, there should be a listing for Microsoft Virtual Private Networking Adapter. If not, select **Add** and double-click **Adapter**.
3. Scroll down the Manufacturers list and select **Microsoft**.
4. Under **Network Adapters**, double-click **Microsoft Virtual Private Networking (VPN support) Adapter**.

Note:

If you do not see the VPN adapter on the list, it means that the operating system component file for this adapter was not loaded when Windows 98 was installed on your PC. You will need your Windows 98 CD-ROM at this point. The procedure follows:

5. Select **Start, Settings**, click **Control Panel**.
6. Double-click the **Add/Remove Programs** icon. The **Add/Remove Programs Properties** window (shown below) opens.



7. Click the **Windows Setup** tab. Momentarily, the **Searching for Installed Components** window pops up, then disappears.
8. Click on **Communications** in the **Components:** list.
9. Press the **Details** button.
10. Scroll down the subcomponents list until you see **Virtual Private Networking**. The box next to this listing needs to have a check mark in it. *If it does not, **click** it to install it.*
11. Click **OK**, and then **OK** in the **Add/Remove Programs Properties** window.

12. Your PC will prompt you to insert your Windows 98 CD. When you do this, VPN will install, and you can follow the steps under **Installing Dial-Up Networking Software (Windows 98 Only)** to activate VPN.

Configure the Connection

To configure a new PPP connection to your corporate network or an ISP, do the following:

1. Double-click the **My Computer** icon.
2. Double-click the **Dial-Up Networking** icon.
3. Activate the **Make New Connection** application by double-clicking on the corresponding icon. The **Welcome to Dial-Up Networking** window appears (this window only appears the first time you use the **Make New Connection** application).
4. Click **Next**. The **Make New Connection** window appears (see figure 2).



Figure 2. Make New Connection (Windows 95 Example)

5. Enter a name for the ISP or corporate network you are dialing (this name appears with the icon that is created).
6. To create a connection to your ISP or corporate network, select **Microsoft VPN Adapter** in the **Select a device** box.
7. Click **Next**. The **VPN Server** field appears (see figure 3).

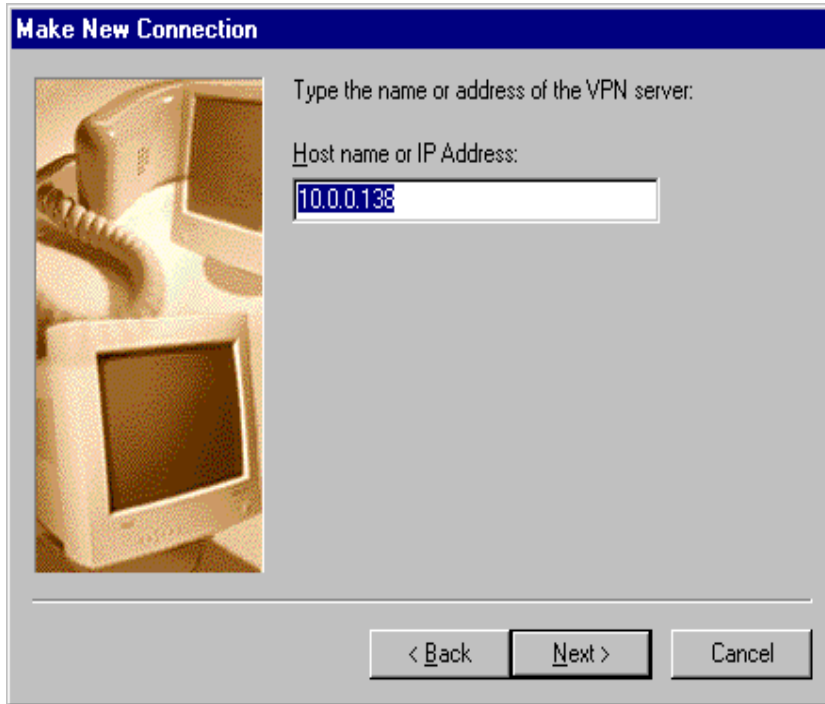


Figure 3. VPN Server Field (Windows 98 example)

8. Enter **10.0.0.138** (default IP address of the ADSL modem).
9. Click **Next**. A window appears indicating you have successfully installed a new dial-up networking Connection.
10. Click **Finish**.

A new icon with the name of the connection you just created is added to your **Dial-Up Networking** folder (see figure 4). You can use this icon to make a connection to your corporate network or ISP.

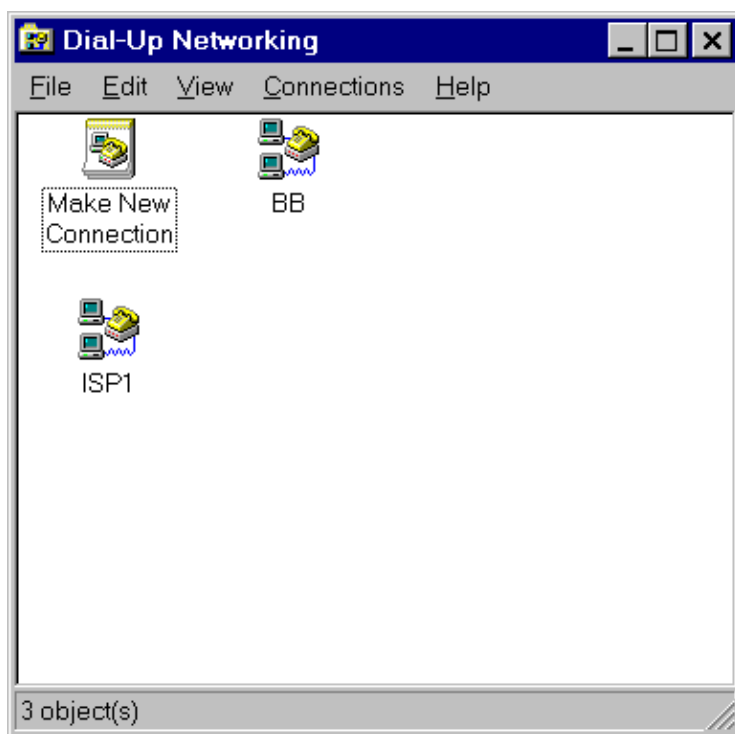


Figure 4. Dial-Up Networking Folder (Windows 95 Example)

Make the Connection

After configuring the PPP connection, make the connection:

1. Double-click the **My Computer** icon.
2. Double-click the **Dial-Up Networking** icon.
3. Activate the connection setup by double-clicking the icon of the connection you want to establish. The **Connect To** window appears (see figure 5).

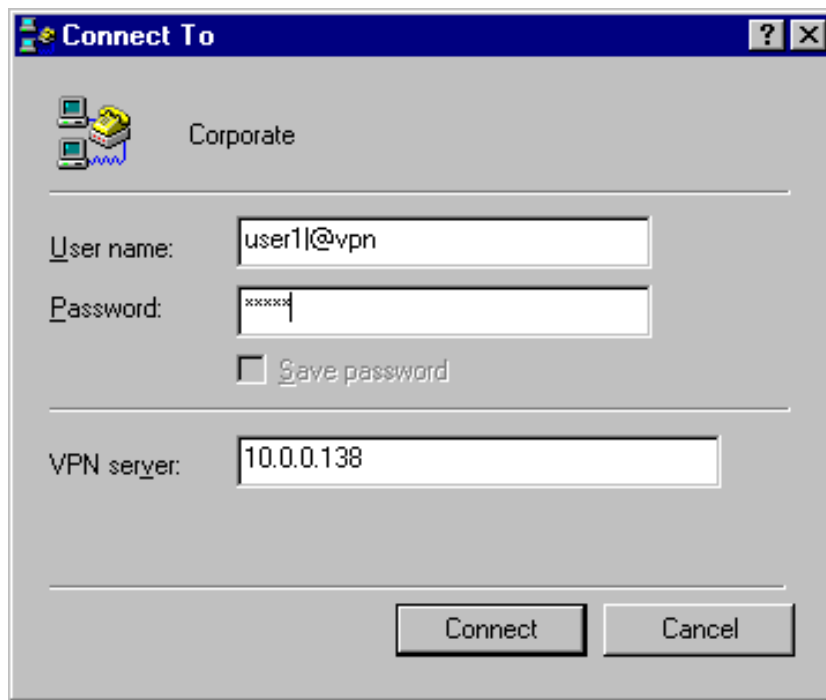


Figure 5. Connect To (Windows 98 Example)

4. Enter the **User** name and **Password** (the IP address defaults to the modem's IP address of **10.0.0.138**).
5. Click **Connect**. The **Connecting To** window appears (see figure 6).

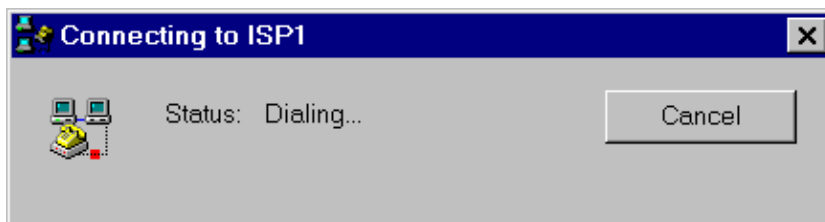


Figure 6. Connecting To (Windows 95 Example)

This window indicates the status of the connection process. When the connection is established, a connection icon appears on your desktop. You are now connected to the destination specified in the connection icon.

Note:

User name and password are unique for a specific remote destination. They must be entered each time you want to set up a connection. Therefore it is useful to create multiple icons, one to each remote destination.

If you intend to use this connection often, it may be useful to create a shortcut to it on your desktop.

To create a shortcut, select the icon and drag it to your desktop. The program asks if you want to create a shortcut to the selected item. Select Yes and a copy of the selected icon appears on your desktop.

You can now make a PPP connection by double-clicking the shortcut.

Break the Connection

To break the connection, proceed as follows:

1. Click the **connection** icon.
2. Click **Disconnect**. The network connection to your ISP or corporate network is disconnected.

Windows NT Dial-Up Procedures

Add Point To Point Tunneling Protocol

Before making connections, the PPTP Network Protocol must be added to your Windows NT platform.

To install the PPTP networking protocol, proceed as follows:

1. Double-click the **My Computer** icon.
2. Double-click the **Control Panel** icon.
3. Double-click the **Network** icon. The **Network** Window appears (see figure 7)

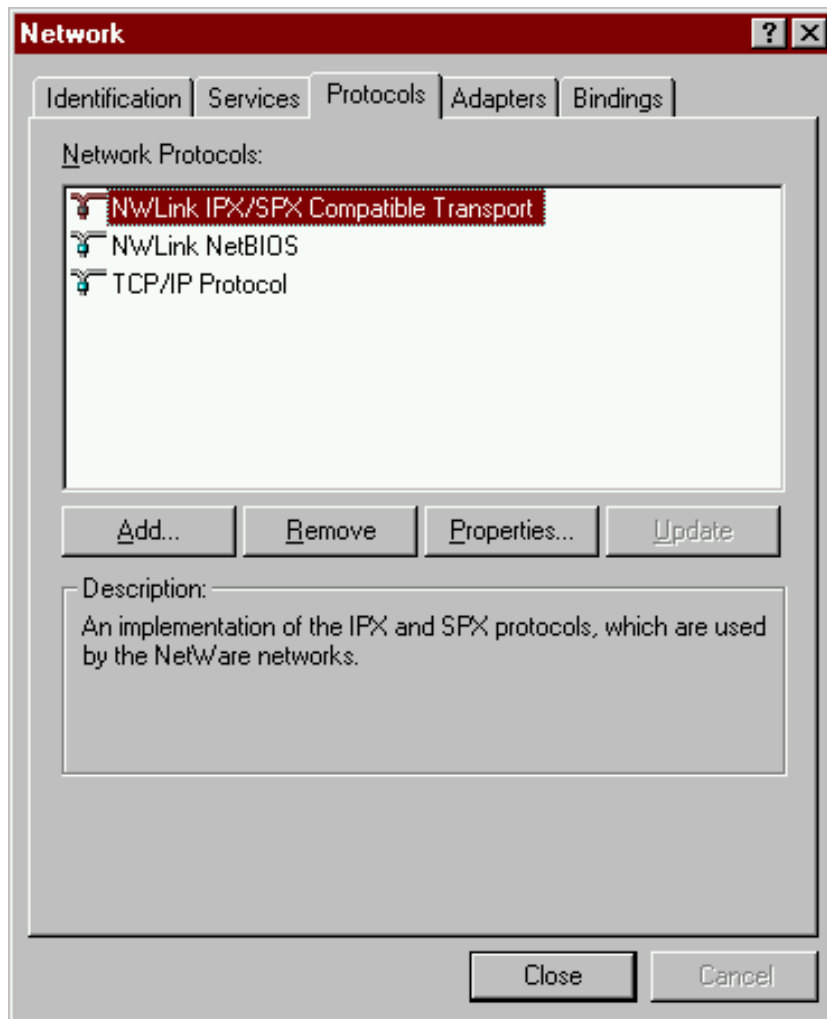


Figure 7. Network Window

4. Select the **Protocols** tab and click **Add**. The **Select Network Protocol** Window appears (see figure 8).

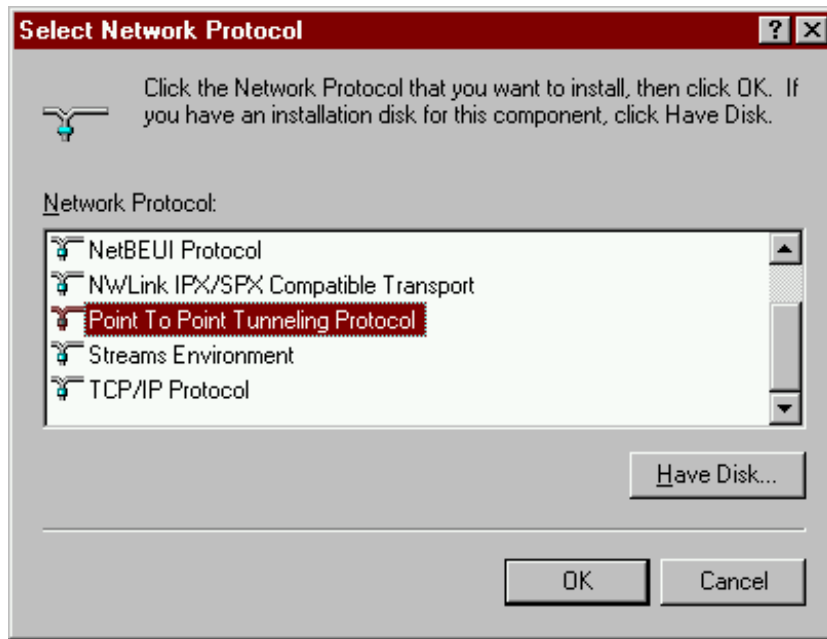


Figure 8. Select Network Protocol Window

5. Scroll the dialog box and select **Point-to-Point Tunneling Protocol** from the list.
6. Click **OK**. The system prompts for a directory to copy installation files.
7. Specify the directory and click **Continue**. The installer loads the PPTP files. The **PPTP Configuration** window appears (see figure 9).

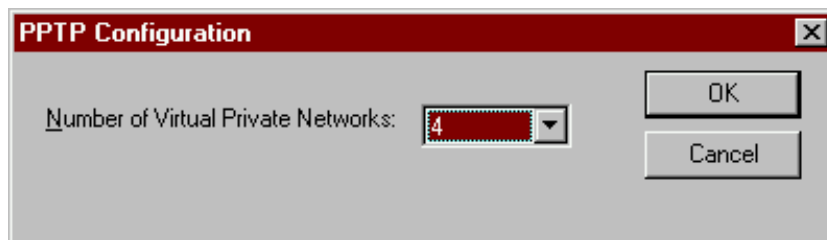


Figure 9. PPTP Configuration Window

8. Click the scroll arrow to select the maximum number of concurrent remote PPTP connections to this Remote Access Services (RAS) server.
9. Click **OK** to continue. The **Setup Message** Window appears (see figure 10).

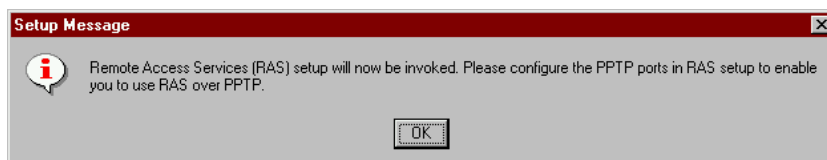


Figure 10. Setup Message Window

10. Click **OK** to continue. This initiates configuration of the RAS.

Note:

You have completed the first part of the installation by adding PPTP as a remote protocol. The remaining steps configure RAS for PPTP.

11. In the **Remote Access Setup** Window (figure 11), add the new VPN ports to RAS by clicking **Add**. The **Add RAS Device** window appears (see figure 12).

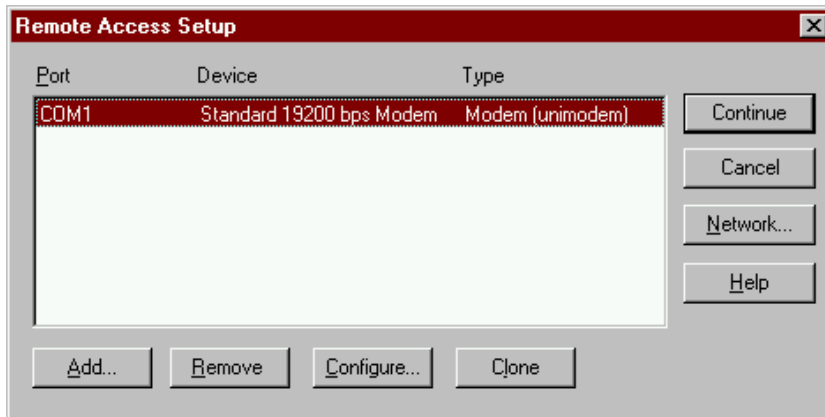


Figure 11. Remote Access Setup Window

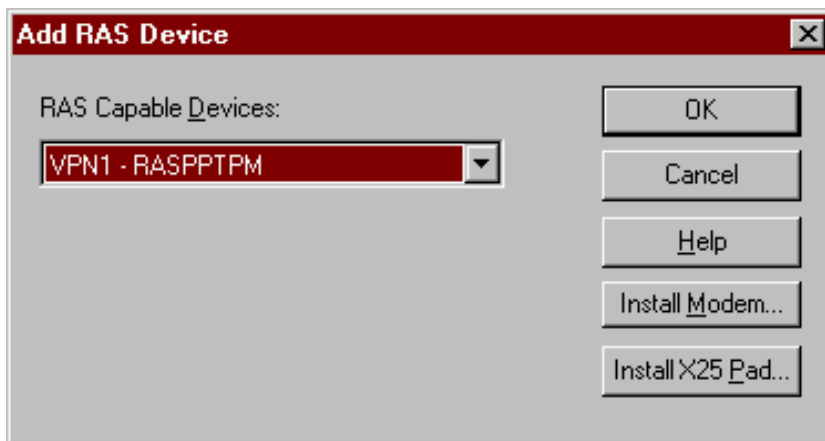


Figure 12. Add RAS Device Window

12. Each RAS Capable Device (also called a port) must be added individually. Double-click a port and click **OK**. The **Remote Access Setup** Window (refer to figure 11) returns.
13. Repeat steps 11 and 12 until all VPN ports are listed in the **Remote Access Setup** Window. Then proceed with step 14.
14. The ports are configured for dial-in only. To change this, select a port in the **Remote Access Setup** window and click **Configure**. The **Configure Port Usage** Window appears (see figure 13).

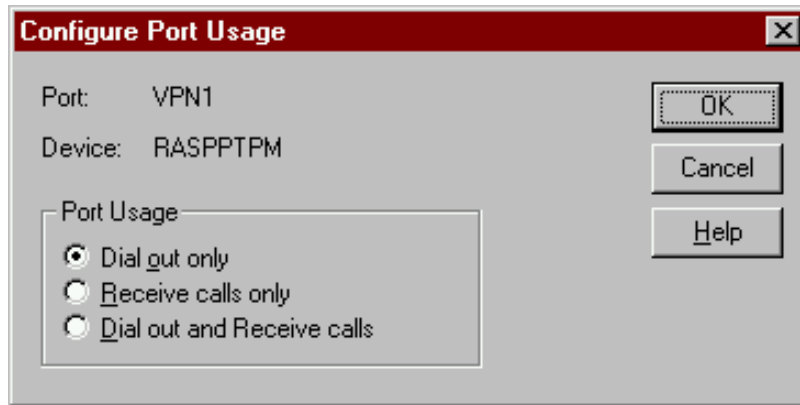


Figure 13. Configure Port Usage Window

15. Select the **Dial-out only** option and click OK.
16. Perform steps 14 and 15 for each port (if required), then proceed with step 17.
17. To define which tunneled protocols you will allow through the VPNs, highlight each port and click **Network**. Then, in the **Network Configuration** Window, enable or disable the protocols you want and click **OK**.

Note:

You can enable or disable IP, IPX, or NetBEUI sessions for each port.

18. Click **Continue**.
19. Click **Close**. The system prompts you to restart the server.
20. Click **Yes** to restart.

Configure the Connection

The following procedure describes how to configure a connection to the corporate network or ISP. A connection contains the IP address of a PPP server and your user account information on that server. You can configure as many connections as you need for different accounts or different PPP servers.

To configure a connection to your corporate network or ISP, do the following:

1. Double-click the **My Computer** icon.
2. Double-click the **Dial-Up Networking** icon.
3. Is this the first time you are creating a connection?
 - If *yes*, go to step **4**.
 - If *no*, go to step **5**.
4. The **Dial-Up Networking** Window indicates that the phonebook is empty and prompts you to add an entry. Click **OK** and go to step **6**.
5. The **Dial-Up Networking** window appears (figure 14). The **Phonebook entry** selection box lists all existing connections. Click **New** to configure a new connection, then go to step **6**.

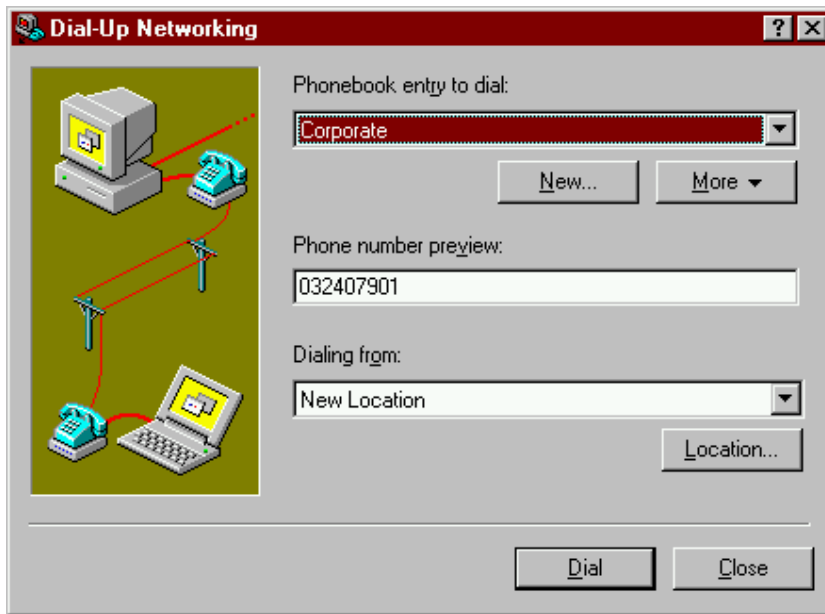


Figure 14. Dial-Up Networking Window

6. The **New Phonebook Entry Wizard** window appears. Enter a name for the connection you are configuring and click **Next**. The **Server** window appears.
7. Activate all options that apply to your connection and click **Next**. The **Phone Number** window appears.
8. Enter the phone number of the dial-up server you are calling and click **Next**. The **Serial Line Protocol** window appears.

Note:

You can assign more than one phone number to each entry. This might be useful if you have a pool of phone numbers to connect to. To do this, click Alternate.

9. Select the serial line protocol offered by the server you are calling and click **Next**. The **Login Script** window appears.
10. Select **Automate with this script** and click **Next**. The **IP Address** window appears.
11. Enter **10.0.0.138**, which is the default IP address of the ADSL modem, and click **Next**. The **Name Server Addresses** window appears.
12. Enter the IP address of a DNS or WINS server on the remote network and click **Next**. The **New Phonebook Entry Wizard** appears indicating that the new connection is configured.
13. Click **Finish** to save the configuration and add it to the **Phonebook entries** drop-down list.

Make the Connection

After configuring the connection, proceed as follows to make the connection:

1. Double-click the **My Computer** icon.
2. Double-click the **Dial-Up Networking** icon.
3. Select the tunnel you want to create in the phonebook selection box and click **Dial**. The **Connect To** window appears.
4. Enter the Password of the VPN server.

Note:

Click Save password if you want to save the password for this connection icon.

5. Enter the optional information in the **Domain** box and click **OK**. The **Connecting To Corporate** window appears.

Note:

The Domain information is required by some Microsoft NT VPN servers.

This window indicates the status of the connection process. When the connection is established, a connection icon appears on your desktop.

Note:

User name and password are unique for a specific remote destination. They must be entered each time you want to set up a connection. Therefore, it is useful to create multiple icons, one to each remote destination.

If you intend to use this connection often, it may be useful to create a shortcut to it on your desktop.

To create a shortcut, select the **Dial-Up Networking** icon and drag it to your desktop. The program asks if you want to create a shortcut to the selected item. Select **Yes**, and a copy of the selected icon appears on your desktop.

You can now make a PPP connection by double-clicking the shortcut.

Break the Connection

To break the connection, proceed as follows:

1. Click the **connection** icon.
2. Click **Disconnect**. The network connection to your ISP is disconnected.

ATM-25 SERVICE

If your service provider is providing ATM-25 Service, your ADSL modem should have model number **3EC 18200 AB** on the bottom of the modem case.

System Requirements

The Alcatel 1000 ADSL high speed modem requires a PC or workstation equipped with an ATMF 25.6 Mb/s network adapter card that supports encapsulations and protocols described in RFC 1483 and RFC 2364.

Hardware Installation

To connect your high speed ADSL modem, follow these steps:

1. Make sure the modem on/off switch is set to the **O** (off) position.
2. Connect the jack end of the power cable to the modem power socket.
3. Plug the other end of the power cable (the end with the power supply adapter) to an electrical outlet.
4. Connect one end of a standard telephone cable (not provided) to the modem connector labeled LINE.

Note:

The line cable may be provided by your service provider during installation, or it can be purchased at your local electronics supply store.

5. Connect the other end of the line cable to a phone jack.
6. Connect one end of the Alcatel data cable (provided) to the modem connector labeled **ATMF-25**.
7. Connect the other end of the Alcatel data cable to the ATMF 25.6 Mb/s network adapter card in your PC.
8. Start your PC.
9. Turn on the modem by switching the on/off switch to **I**.

Power/Sync Light

The **Power/Sync** light begins blinking. After about two minutes, the light should be solid green. If the light is not solid green, check the telephone line cable between the modem LINE connector and the phone jack. If this connection is secure and the **Power/Sync** light is not solid green, contact your service provider for assistance.

ATMF-25 Light

The ATMF-25 light should be solid green. If the light is not solid green, check the Alcatel data cable connection between the modem ATMF-25 connector and the ATMF 25.6 Mb/s network adapter card in your PC. If this connection is secure and the ATMF-25 light is not solid green, contact your service provider for assistance.

Accessing Online Services

When your PC is started and your ADSL modem is switched on, a connection is automatically established with your online service. Through this connection, you can access the World Wide Web or your corporate network or other online services.

SECTION 2: DESCRIPTION OF FEATURES

The Alcatel 1000 ADSL high speed modem provides high speed virtual connections to multiple services simultaneously, using ATM/ADSL on standard telephone twisted pairs.

Asymmetric Digital Subscriber Line (ADSL) is a high speed transmission technology that takes advantage of existing copper telephone lines and new telephone technologies to deliver data services to residential and small business users located within a limited distance from the Central Office (CO) exchange. Additionally, ADSL operates over standard voice-grade telephone circuits without disturbing the existing telephone connections. Telephone lifeline service is NOT impacted by any failure of the modem.

The Alcatel 1000 ADSL high speed modem features industry standard ATM Forum-25.6 Mb/s (ATMF) or 10BASE-T Ethernet interfaces. Both ATMF-25 and Ethernet can use the high bit rates available through the ADSL line.

The ATMF-25 interface plugs into a Personal Computer (PC) with an ATM-Forum (ATMF) 25.6-Mb/s interface.

The 10BASE-T Ethernet interface allows single or multiple PCs to share the high speed ADSL line.

Figure 15 shows the generic network infrastructure. Residential or small office ADSL users have access to corporate Local Area Networks (LANs) or Internet Service Providers (ISPs) or both.

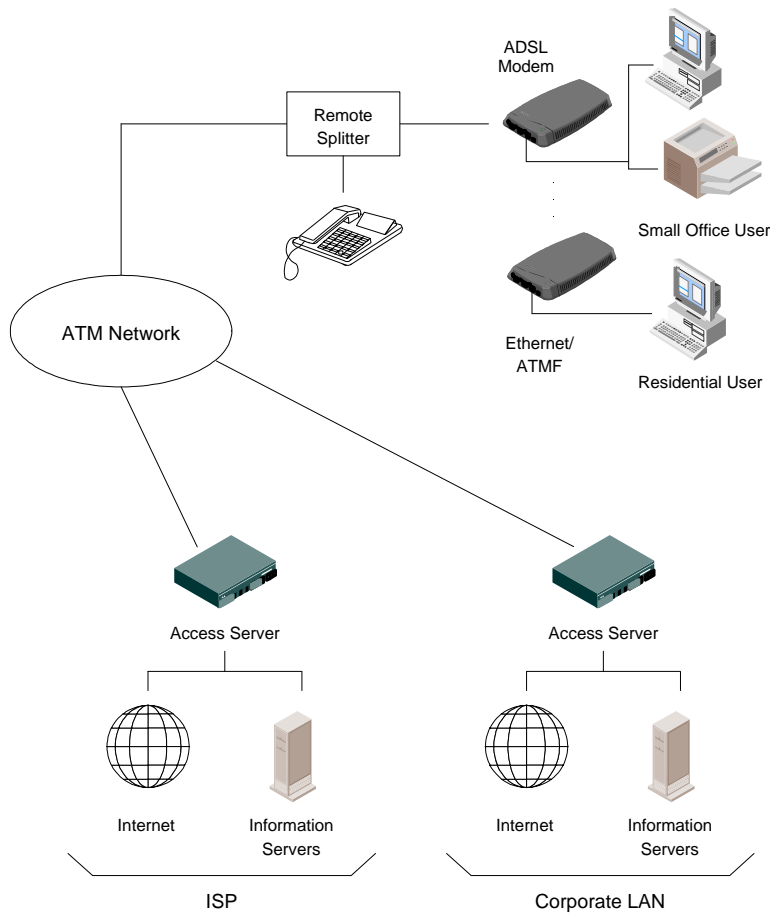


Figure 15. General Network Architecture

MODEM CONNECTIONS

The ADSL modem (see figure 16) has two connectors and a power switch:

- LINE - Connection to phone jack or remote splitter (RJ14)
- One of the following:
 - ATMF-25 - Connection to terminal equipment; for example, single PC with ATMF-25 interface (RJ45)
 - 10BASE-T/MDI-X - Connection to Ethernet equipment (RJ45/MDI-X); for example, single workstation, single PC with Ethernet connection, or mini-LAN via Ethernet hub
- Power Socket - Connection to coaxial plug from the power supply adapter

- Power Switch - On/Off switch

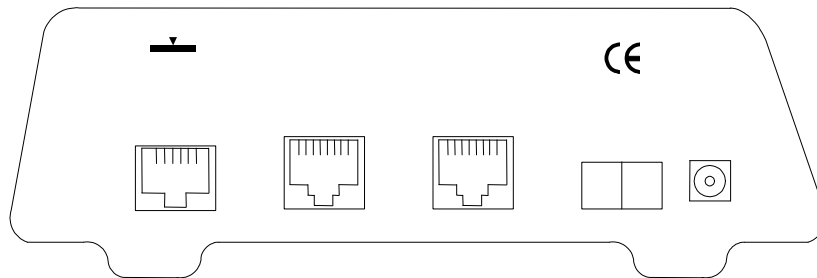


Figure 16. Connectors on ADSL Modem

Note:

The modem has either an ATMF-25 connector or a 10BASE-T/MDI-X connector, not both.

Connector Pinout

See figure 17 and table C for details on the modem connectors.

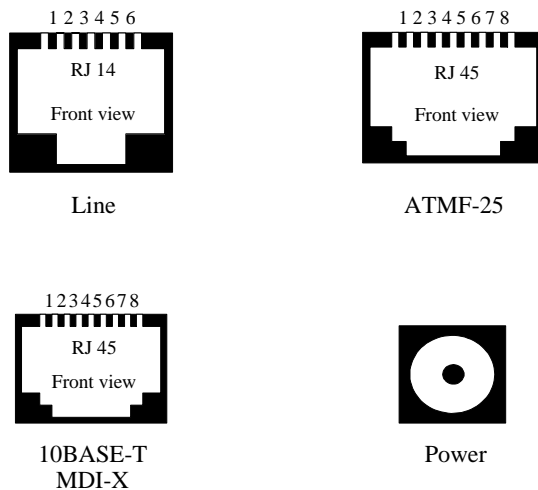


Figure 17. Connector Details

Table C. Connector Pinout			
Connector	Pin No.	Signal Name	Function
Line	2	Wire_A	Subscriber line wire A
	5	Wire_B	Subscriber line wire B
ATMF-25	1	Rx+	Receive data from DTE (+)
	2	Rx-	Receive data from DTE (-)
	7	Tx+	Transmit data to DTE (+)
	8	Tx-	Transmit data to DTE (-)
10BASE-T MDI-X	1	Rx+	Receive data from DTE (+)
	2	Rx-	Receive data from DTE (-)
	3	Tx+	Transmit data to DTE (+)
	6	Tx-	Transmit data to DTE (-)
Power	Inner	+12 V _{DC}	Power supply adapter connection (+)
	Outer	GND	Power supply adapter connection (-)

Power Supply

The ADSL modem is equipped with a plugged external power supply adapter.

1. Plug the coaxial plug from the power supply adapter into the ADSL modem power connection socket.
2. Plug the power supply adapter into the power outlet and switch on the ADSL modem.
3. Check the visual indicators on top of the ADSL modem. The visual indicator marked Power/Sync. starts flashing red. When this indicator becomes

continuously green, the ADSL modem is ready for operation with terminal equipment.

Visual Indicators

The functions for the visual indicators on top of the ADSL modem (figure 18) are listed in table D.

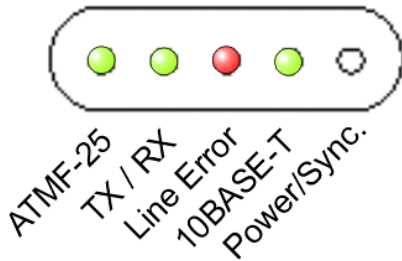


Figure 18. Visual Indicators

Table D.		
Indicator		Meaning
Name	Color	
ATMF-25	Green	ATMF connection active
TX/RX	Green	Data transmit / receive
Line Error	Red	Excessive line errors - bad ADSL line
10BASE-T	Green	Ethernet connection active
Power/Sync	Red	Power-on - initialization phase
	Green	Line synchronization - ready to operate

Subscriber Line Interface

The ADSL access network provides two types of traffic over a single metallic twisted-pair:

- Data encapsulated in Asynchronous Transfer Mode (ATM) cells.
- Voice connections (regular telephone service).

These two traffic types are combined on the single twisted-pair by means of the Frequency Division Multiplexing (FDM) technique.

To maintain your normal phone service, a remote splitter must be installed first (see figure 19).

Note:

Existing in-home telephone wiring varies greatly in its installation. For most Internet service applications, existing in-home wiring provides adequate performance for the ADSL modem. Improved performance is obtained from unshielded twisted pair Category 5 cable between the remote splitter and the ADSL modem.

After installing the remote splitter, connect the modem connector marked *LINE* to the phone jack.

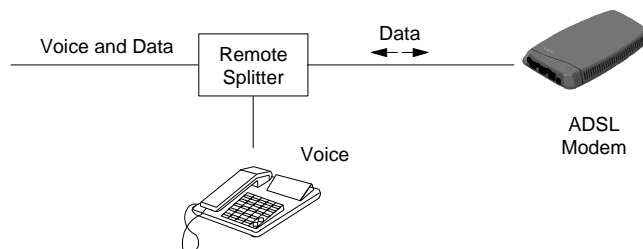


Figure 19. Subscriber Line Interface to Remote Splitter

Ethernet Interface

The Ethernet port, available on some ADSL models, is a 10BASE-T interface of type MDI-X.

When the terminal equipment is correctly connected to the ADSL modem, the visual indicator, marked *10BASE-T*, will be solid green. This indicates that the wiring between the modem and the PC is correct. If not, check the cable layout.

Single PC Configuration

A single PC with integrated Ethernet port or Ethernet Personal Computer Network Interface Card (PC-NIC) can be connected to the ADSL modem (see figure 20).

The connection must be made with a *straight-through* cable (see figure 21) since a PC is equipped with an Ethernet interface of type Medium Dependent Interface (MDI).

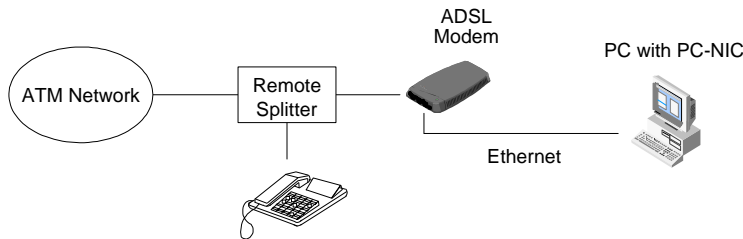


Figure 20. Single PC Configuration

Straight-Through Cable Layout

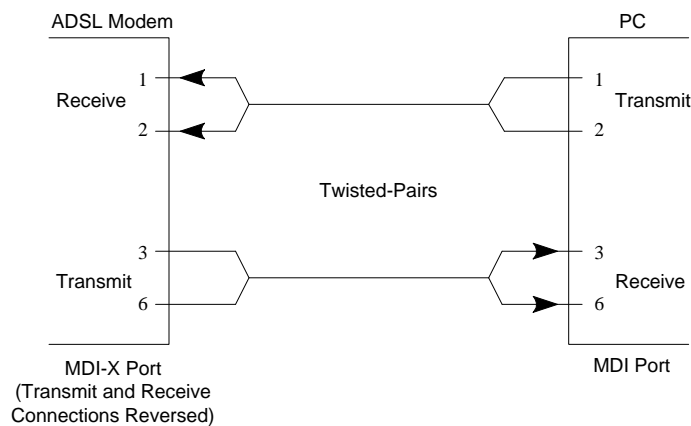


Figure 21. MDI-X Internal Crossover

Multiple PC Configuration

To connect multiple PCs to an Ethernet interface, a hub must be installed first (see figure 22).

The connection of the hub to the ADSL modem must be made with a *crossover* cable (see figure 23), since the hub is equipped with an Ethernet interface of type MDI-X.

Note:

If the port of the hub connected to the ADSL modem is equipped with an MDI/MDI-X switch and the active position is MDI, a straight-through cable must be used.

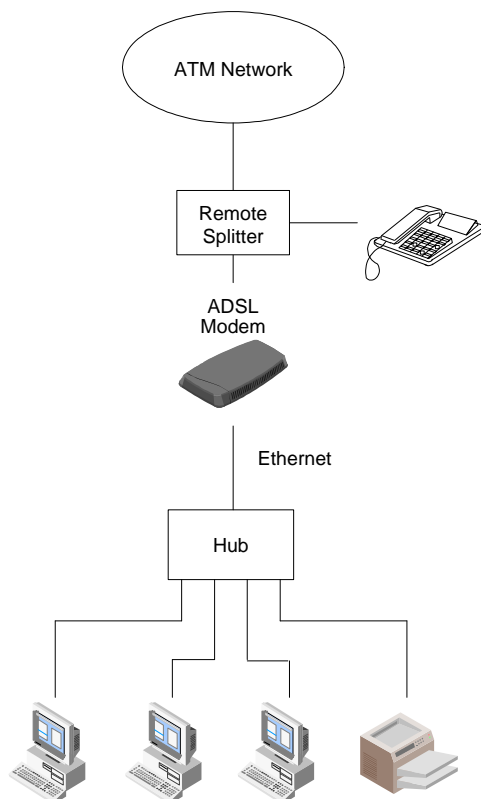


Figure 22. Multiple PC Configuration

Note:

The maximum length of any 10Base-T segment must not exceed 100 meters (328 feet).

Crossover Cable Layout

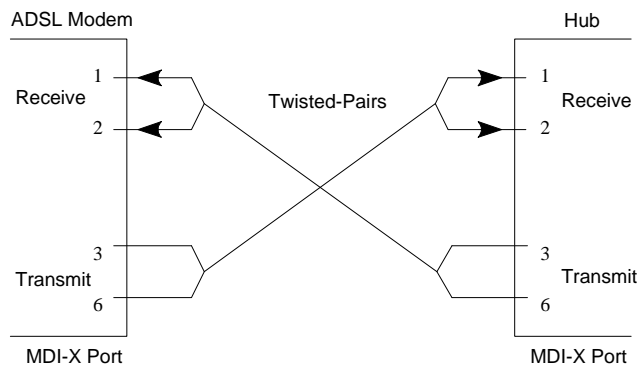


Figure 23. MDI-X to MDI-X External Crossover

ATMF-25 Interface

The ATMF port, available on some ADSL models, is an ATMF-25 interface. The interconnection between the ATM Forum equipment and the ADSL modem must always be made with a *straight-through* cable (the ATMF-25 interface of the modem is ATM *network* equipment and most ATMF-25 PC-NIC cards are ATM *end* equipment).

A single PC with an ATM Forum card can be connected directly to the ATMF interface of the ADSL modem (see figure 24).

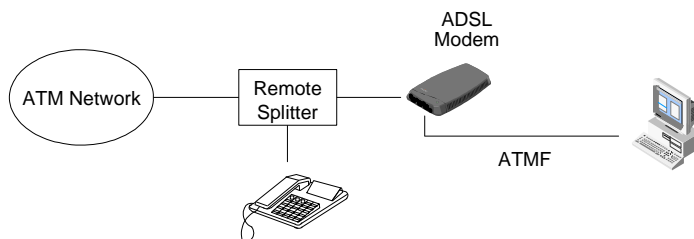


Figure 24. ADSL Modem with ATMF Interface

When the terminal equipment is correctly connected to the ADSL modem, the visual indicator, marked ATMF-25, will be solid green. This indicates that the wiring between the ADSL modem and the PC is correct. If not, check the cable layout.

NETWORK CONNECTIONS

The Alcatel 1000 ADSL high speed modem supports two methods for accessing remote sites like corporate networks or the World Wide Web via a local ISP. The two methods are *direct* networking and *dial-up* networking.

Direct networking describes a connection that is always active. In other words, no preliminary steps are required to obtain a connection. Once service is enabled, the user switches on the PC and the modem, and connects to the remote site (the ISP or corporate network).

Dial-up networking describes a procedure in which the user requests a connection by dialing the network. The remote site requires a personal user account and password before access is allowed.

If your modem has an ATMF-25 port, it supports both direct and dial-up networking methods. Applications on your PC determine which method you are using.

If your modem has a 10BASE-T port, the networking method depends on the Ethernet protocol you are using:

- Direct networking is supported by an IEEE 802.1D Transparent Databridge in the modem. You configure your local workstations with the appropriate parameters or allow your workstations to automatically assume the parameters from the network via specialized protocols.
- Dial-up networking relies on the standard Point-to-Point Protocol (PPP) and local tunneling using the industry Point-to-Point Tunneling Protocol (PPTP).

To determine which networking method you must use, contact your local ISP or your corporate network administrator.

Note:

Only typical networking solutions are presented here, although various combinations of available protocols and equipment allow numerous architectures and networking solutions.

Virtual Connections

The ADSL modem uses ATM as a transport protocol. ATM is a connection-oriented packet-switching technology using fixed-size packets (called *cells*) to carry traffic through a public or private network.

ATM connections, typically referred to as *virtual connections*, are identified by two values called a Virtual Path Identifier (VPI) and a Virtual Channel Identifier (VCI). A particular VPI/VCI combination identifies a virtual connection between two

ATM devices in the network. An end-to-end connection is established by linking the virtual connections between devices. This requires all intermediate ATM devices to have VPI/VCI assignments.

For the ATM network, these assignments are the responsibility of network operators. These operators configure ATM devices to provide a Permanent Virtual Connection (PVC) through the network. The PVC provides an *always-on* service. Once the ADSL modem is connected to the subscriber line, an end-to-end connection can be established.

ATM-Forum Interface

If terminal equipment is connected to the modem's ATMF-25 port, ATM service is delivered to the PC. This means ATM cells from applications on the PC are captured by the ATMF interface and cross-connected or switched to the ADSL line.

An ATMF-25.6 PC-NIC is required to terminate the ATM connections in the PC. The PC-NIC must support encapsulations and protocols described in RFC 1483 and RFC 2364.

The virtual channels cross-connected in the ADSL modem between the ATMF interface and the ADSL line can have VPI/VCI values listed in table E. A connection is possible only if the PC-NIC is sending and receiving ATM cells on one (or more) of these virtual channels.

Table E. ATMF VPI/VCI Values		
Parameter	Value	Meaning
VPI	0-5	Virtual Path Identifier
VCI	0-65535	Virtual Channel Identifier

Ethernet Interface

The Ethernet interface terminates ATM connections, extracting frames from arriving cells and encapsulating frames in departing cells. Only those frames supported by the modem are extracted or encapsulated. Table F lists the supported encapsulations and VPI/VCI values based on connection type.

Table F. Ethernet Parameters			
Connection	VPI	VCIs	Encapsulation
Bridged	8	35, 43, 51, 59	RFC 1483 ^[1]
PPP/PPTP	8	67, 75, 83, 91, 99, 107, 115, 123	RFC 2364 ^[2]
^[1] Ethernet V2.0/IEEE 802.3 bridged PDUs for both LLC/SNAP and VCMUX methods ^[2] PPP PDUs for both LLC/NLPID and VCMUX methods			

Standard Ethernet protocol is used to transport Ethernet frames between the ADSL modem and the PC. The modem provides an IEEE 801.1D compliant Self-Learning Bridge and/or a PPP/PPTP architecture, depending on the model.

ISP/Corporate Network Requirements

The ISP or corporate network administrator must provide you with the following information:

- VPI/VCI values for a virtual connection
- Protocol required to support the virtual connection

BRIDGED CONNECTIONS

Bridging is a standardized layer 2 technology. It is typically used in corporate networks to extend the physical reach of a single LAN segment, and increases the number of stations on the common LAN without compromising performance.

One important characteristic of bridging is the number of bridge ports. The ADSL modem has four remote virtual ports on the ADSL interface and one local port (Ethernet) on the user interface.

The ports on the ADSL interface are described as virtual because they are associated with the ATM virtual connections configured on the ADSL line. To establish a connection from any of the remote destinations to the bridge port, PVCs must be configured end-to-end through the network.

The VPI/VCI values for Ethernet/bridging are listed in table G.

Table G. Ethernet VPI/VCI Values		
Parameter	Value	Meaning
VPI	8	Virtual Path Identifier
VCI	35, 43, 51, 59	Virtual Channel Identifier

Other parameters for the Ethernet/bridging functionality are listed in table H.

Table H. Ethernet Parameters		
Parameter	Value	Meaning
LLC/SNAP or VC-MUX	LLC/SNAP	RFC 1483 Encapsulation method
FCS Preservation	OFF	Frame Check Sequence
Compression	OFF	Tinygram compression
AGING time	5 (minutes)	Bridge aging time

Multiprotocol

Since bridging functionality operates below the network layer, it is transparent to any layer 3 protocol. PCs or workstations can use Transmission Control Protocol (TCP)/Internet Protocol (IP), Sequenced Packet Exchange (SPX)/Internetwork Packet Exchange (IPX), AppleTalk, or any other protocol suite. This implies that any protocol currently being used for applications can be transported to remote destinations and vice versa.

Any type of machine (PC, MAC, or Sun workstation) can be connected via Ethernet to the ADSL modem.

Number of Machines Supported

The bridge database can accommodate as many as 256 entries simultaneously.

Assume a sample configuration with four remote ports and one local port (Ethernet interface): If all systems are evenly distributed over all the ports, you

could connect about 50 systems per port to completely fill up the database (the upstream bandwidth is limited to 1 Mb/s). If only one virtual port is in use, the 256 entries can be divided over two ports (virtual, Ethernet port).

Plug and Play

The ADSL modem is a plug and play device; through the bridge *learning* mechanism, it discovers at which side of the bridge workstations are located. It prevents traffic submitted to the local printer from crossing the bridge. It allows frames belonging to transmissions with remote workstations to pass over the ADSL line.

Both the local PCs and remote PCs must be configured properly for end-to-end connections.

PC/Workstation Configuration

For detailed information on how to configure the PC, contact the ISP or corporate network administrator. Depending on the network protocols being used (IP, IPX, AppleTalk, NetBEUI, etc.), the PC configuration can include a wide range of parameters. The ADSL modem does not interfere with these higher layer protocols, as it is transparent to all of them.

The TCP/IP family is used as a configuration example (procedures may equally apply to other protocol families).

Every IP host must have a unique IP address, whether connected to a corporate network or the Internet. The ADSL modem is transparent to IP protocols; it allows PCs to operate with both fixed and/or dynamic IP addresses.

Fixed IP Address

Fixed IP addresses are primarily used by corporate network users; LAN administrators provide them. Before starting, the PC must be configured with an IP address.

When the PC is started, a connection is established with the remote site through the automatic exchange of specific TCP/IP messages and bridging operations.

Dynamic IP Address

If the ISP or corporate network supports Dynamic Host Configuration Protocol (DHCP), a temporary IP address is automatically obtained for the session.

You must configure the PC to use BOOTP/DHCP.

Each time the PC starts up, it automatically broadcasts an IP address request. When the remote entity responds to this request, you are connected.

The following instructions to enable DHCP assume a Windows 95 operating system:

1. Start the PC and double-click the **My Computer** icon.
2. Open the **Control Panel** and double-click the **Network** icon.
3. In the **Network** window, select the **Configuration** tab.
4. Select **TCP/IP Protocol - 3COM EtherLinkIII ISA**.
5. Click **Properties**.
6. In the **TCP/IP Properties** window, select the **IP Address** tab.
7. Select **Obtain an IP address automatically**.
8. Click **OK** to close the TCP/IP Properties window.
9. Click **OK** to close the Network window.
10. Select **yes** when prompted to restart the PC.

After the PC is restarted, it acquires its own IP address from the server using BOOTP/DHCP.

Bridged Service with Filtering

The 3EC 18202 DB version of the modem provides an IEEE 802.1D Transparent Databridge with administrative filtering capability on the bridge ports to reduce security risk and bandwidth requirements on the ADSL interface.

Filtering Function

The filtering applied to the bridge ports performs the following functions:

- Blocks all multicast frames
- Forwards IP and ARP broadcast frames
- Forwards IP unicast frames

Multicast Traffic on Bridge Ports

The modem blocks all multicast traffic in both upstream and downstream directions. All multicast frames arriving on the Ethernet port are silently

discarded. Also, all multicast frames arriving on the remote virtual port(s) are silently discarded.

Broadcast Traffic on Bridge Ports

The modem forwards only IP and ARP broadcast frames in both upstream and downstream directions. IP and ARP broadcast frames arriving on the Ethernet port are forwarded to the remote virtual port(s). All other broadcast frames arriving on the Ethernet port are silently discarded.

IP and ARP broadcast frames arriving on the remote virtual port(s) are forwarded to the Ethernet port. All other broadcast frames arriving on the remote virtual port(s) are silently discarded.

Unicast Traffic on Bridge Ports

The modem forwards only IP unicast frames in both upstream and downstream directions. IP unicast frames arriving on the Ethernet port are forwarded to the remote virtual port(s). All other unicast frames arriving on the Ethernet port are silently discarded.

IP unicast frames arriving on the remote virtual port(s) are forwarded to the Ethernet port. All other unicast frames arriving on the remote virtual port(s) are silently discarded.

POINT TO POINT TUNNELING CONNECTIONS

Introduction

If local workstations require connections to the outside world via the modem s Ethernet interface and your ISP or corporate network administrator requires that you use a dial-up connection, you must use Point-to-Point Tunneling Protocol (PPTP). This protocol enables Point-to-Point Protocol (PPP) over an Ethernet interface.

PPP/PPTP Network

Figure 25 provides an overview of the end-to-end network protocol.

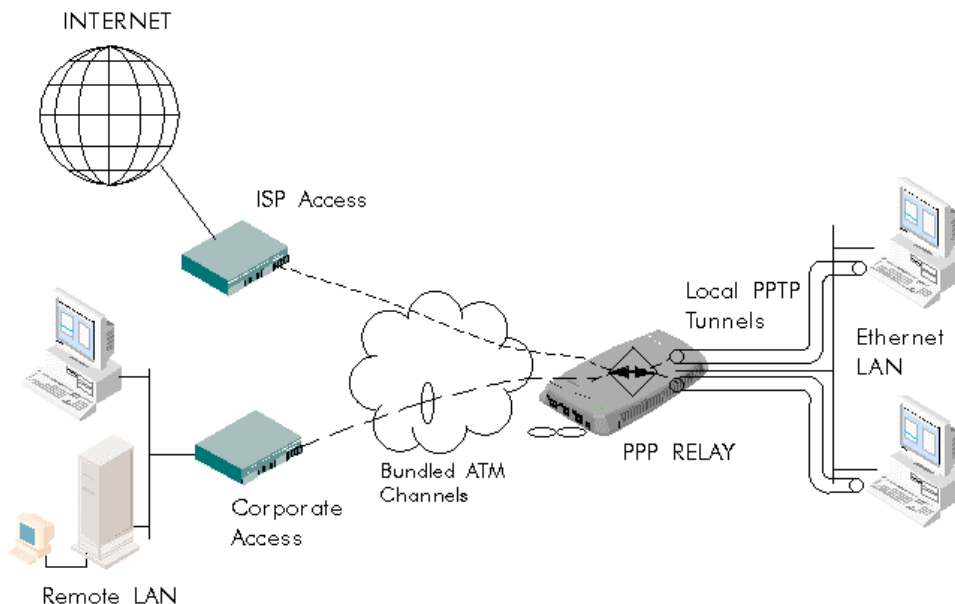


Figure 25. Network Protocol Architecture

The dial-up icons you create on the PC allow you to establish connections to your corporate network or to the Internet via your local ISP. Double-clicking a dial-up icon establishes a local PPTP tunnel from your PC over your local network to the modem. The modem terminates this tunnel and relays all traffic inside it to a free ATM connection or to an ATM connection you select.

Because PPTP tunneling is based on the IP protocol, an IP connection between your local PCs and the modem must exist before setting up a local tunnel. Configuration of IP functions in the modem is described in the [CHANGING THE MODEM SETTINGS](#) section (click on that section's heading to return here.)

Note:

Various platforms support PPTP. Subsequent examples are provided for Windows 95, Windows 98, and Windows NT. Other operating systems are not covered.

Establishing PPP/PPTP Connections

Double-clicking a previously created connection icon is all that is required to connect to your ISP or your corporate network.

By default, the modem is configured for eight PPP/ATM connections. However, check with your ISP or corporate network administrator to ensure that these connections are cross-connected in the wide area network to enable end-to-end connections.

With PPP/PPTP, you indicate which remote destination you want to connect to. This requires you to modify the VPN Server field in the Connect To window as described next.

Any Connection

If you leave the VPN Server field unchanged (with only the IP address of the modem or its corresponding name visible), the modem automatically connects you to one of the free ATM channels when you click Connect (see figure 26). This is the simplest connection and works best if all the ATM channels are connected to the same remote destination (see figure 27).

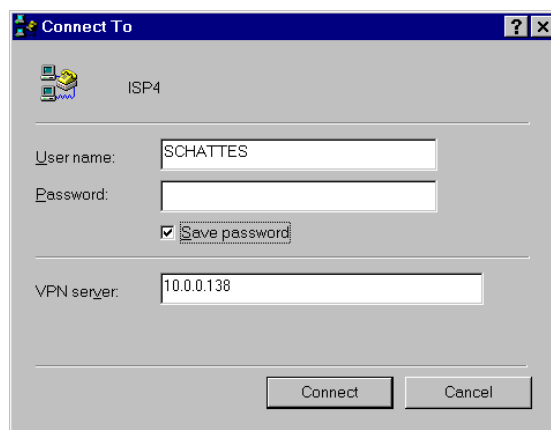


Figure 26. Connect To Window

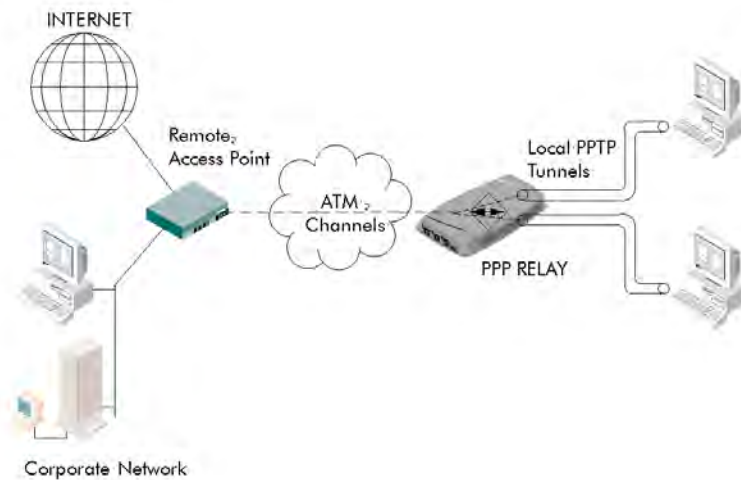


Figure 27. All ATM Channels to a Single Remote Destination

Specific Connection

It is possible to connect to more than one remote site through the ADSL modem, for example, your ISP and your corporate network. In this case, the modem's ATM channels are allocated to each site. For example, four ATM channels could be provisioned to the ISP and four channels to the corporate network. The best practice is to specify the site you want to connect to. Otherwise, the modem selects the first available connection, which could be either the corporate site or the ISP.

Check with your ISP and your corporate network administrator to verify which ATM virtual channels are cross-connected to each site. In the example shown in figure 28, channels 0-3 are cross-connected to an ISP and 4-7 to a corporate network.

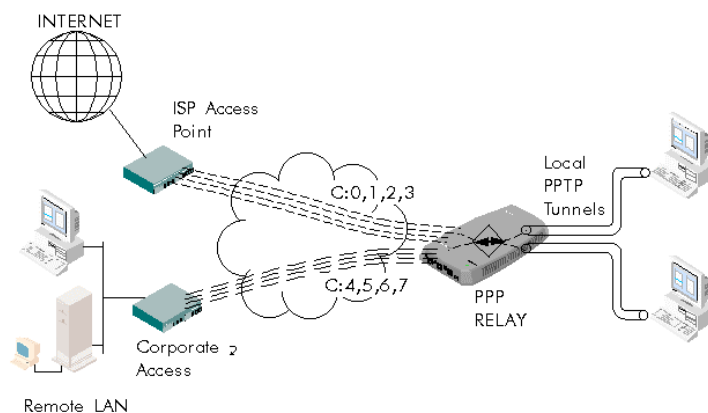


Figure 28. ATM Channels over Multiple Remote Destinations

You can specify the ATM connection to use by inserting **C:n** in the **VPN Server** field of the **Connect To** window (see figure 29). **C** refers to **C**onnection and **n** is a virtual ATM channel in the range 0 to 7.

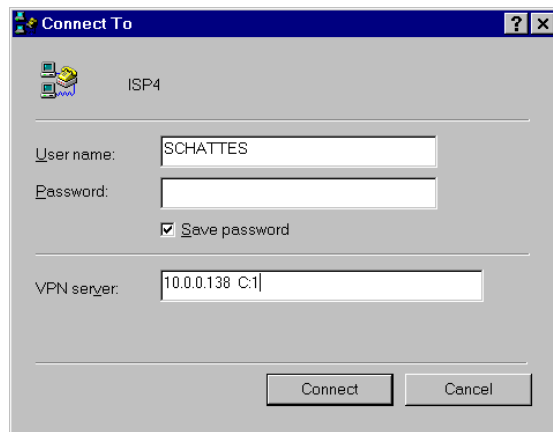


Figure 29. Specifying a Connection in the VPN Server Field

Custom Connection

You can customize the selection of remote destinations by entering a name for a Channel ID in the PPTP Destination Table (see figure 30).

Channel ID	Name	State
0	isp1	IDLE
1	isp2	IDLE
2	YourISP	IDLE
3	YourISP	IDLE
4	Alcatel	IDLE
5	Alcatel	IDLE
6	Alcatel	IDLE
7	Alcatel	IDLE

Figure 30. PPTP Destination Table

For example, if you entered Alcatel next to Channel ID 4 in the Connection Icon, you could now simply type **N: Alcatel** in the VPN Server field. Refer to figure 31.

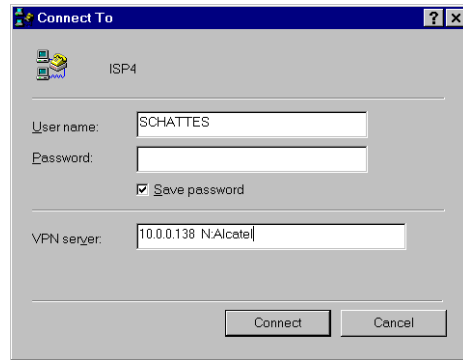


Figure 31. Specifying a Name in the VPN Server Field

Number of PPP/PPTP Connections Supported

Tunneling does not affect the local network; you may add as many workstations as the local network supports. However there is an upper limit to the number of simultaneous outbound connections.

Unlike bridging, a PPP/ATM channel cannot be shared by multiple users. Every local user establishing a tunnel requires an ATM channel on the network. Therefore, any user on the local network can create a tunnel as long as unused ATM channels are available.

By default, the modem supports eight PPP/ATM channels. If all PPP/ATM channels are in use and a user tries to create a new tunnel, the modem refuses the request and an error message appears on the screen.

Note:

In the PPTP Destination Table, you can determine which destination each tunnel is associated with.

LAN Protocols Supported

TCP/IP is used to establish PPTP tunnels between local workstations and the modem. The data transported end-to-end may be TCP/IP, IPX/SPX, or NetBEUI. The limitations are not caused by the tunneling protocol or the ATM connection, but are a function of the PPTP client.

Currently, Windows 95, Windows 98, and Windows NT support three protocols in the tunnel. All three can be disabled individually.

Known Limitations

The tunneling applications supported on your PC might have limitations. Limitations of the most popular platforms currently in use are described next.

One Tunnel

Windows 95 and Windows 98 allow you to create only one tunnel at a time. This means that you cannot connect to an ISP and the corporate network simultaneously.

Tunneling within a Tunnel

Tunneling within a tunnel is not possible with Windows 95 because of its single tunnel limitation.

Note:

Windows NT does not share these two limitations. It is possible to create multiple tunnels and simultaneously connect to multiple remote destinations. A tunnel within a tunnel is also possible, assuring better end-to-end security.

Local Connection is Lost

After you create a tunnel, communication with local workstations may be lost. This is because the Windows operating system adds a new default gateway to its routing table. This new default gateway points to the tunnel. Because TCP/IP is designed to use only one default gateway, connection through the original gateway is lost.

When the tunnel is terminated, connection through the original default gateway is reestablished.

You can avoid this problem by manually adding routes to local destinations in the routing table.

ADVANCED CONFIGURATIONS

Overview

Access to an ISP or corporate network typically requires minimal configuration for end-to-end connectivity. However, it is possible to customize settings of the ADSL modem to accommodate specific configurations. The ability to configure parameters in the modem requires a local connection between the modem and the PC.

This connection is made through the Ethernet port of the modem. An IP address is configured to allow a web browser in the PC to communicate to the modem.

The following are options for local connection to the modem:

- The modem is preconfigured with IP address **10.0.0.138**
- The default IP address can be changed to a different address
- The modem can be automatically configured via BOOTP
- The modem supports logical multi-homing

Note:

Local configuration is only possible through the Ethernet interface of the modem.

IP Parameters

The IP address used for local connection is limited to the private local network. The IP address must be compatible with your local network and must be unique in that network.

Note:

For tunneling via PPTP, a second set of IP addresses is automatically negotiated to establish an end-to-end connection.

The following example configurations are described:

- A single PC connected to the modem
- A small network of PCs (workgroup) connected to the modem
- Advanced configurations using BOOTP to distribute parameters and using routers to create complex networks

Subnetmask and Default Gateway Parameters

The Subnetmask and Default Gateway parameters are used only if the local network is configured with an IP router.

The Default Gateway parameter is set to none and the Subnetmask parameter reverts to the default netmask for the IP address class. Table I lists the default netmasks of the different IP address classes.

Table I. Default Netmask	
IP Address Class	Default Netmask
A	255.0.0.0
B	255.255.0.0
C	255.255.255.0

Sample Configurations

Single PC

The modem comes preconfigured with IP address 10.0.0.138. To establish a local connection between the PC and the modem, configure the IP address of the PC within the same IP network of the modem, and if subnetting is applied, within the same IP subnet of the modem. The address must be unique within the network.

It is recommended that the PC is allocated an IP address that falls within one of the private ranges of the modem or to use an address in the default range of the modem, for example, 10.0.0.140 (refer to figure 32).

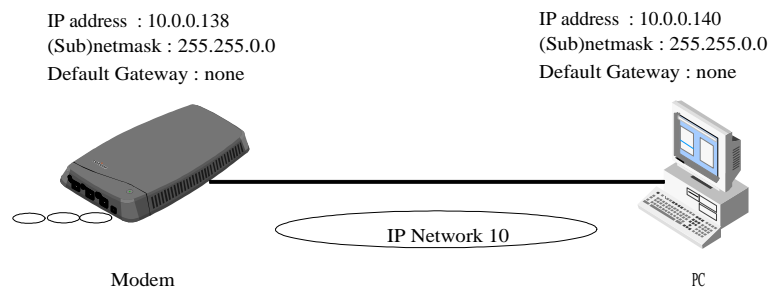


Figure 32. Example of Single PC Configuration

The modem IP address falls within one of the ranges set aside by IANA for private IP networks. These ranges are defined in RFC 1918, Address Allocation for Private Internets. Table J lists the currently defined ranges.

Table J. Address Allocation for Private Networks	
IP Address Range	Allocation
10.0.0.0 to 10.255.255.255	1 class A network number
172.16.0.0 to 172.31.255.255	16 contiguous class B network numbers
192.168.0.0 to 192.168.255.255	256 contiguous class C network numbers

Small Workgroup

To set up a local workgroup around the modem, you can use the private IP address range of the modem. Allocate IP addresses to each PC and make sure all addresses are unique (figure 33).

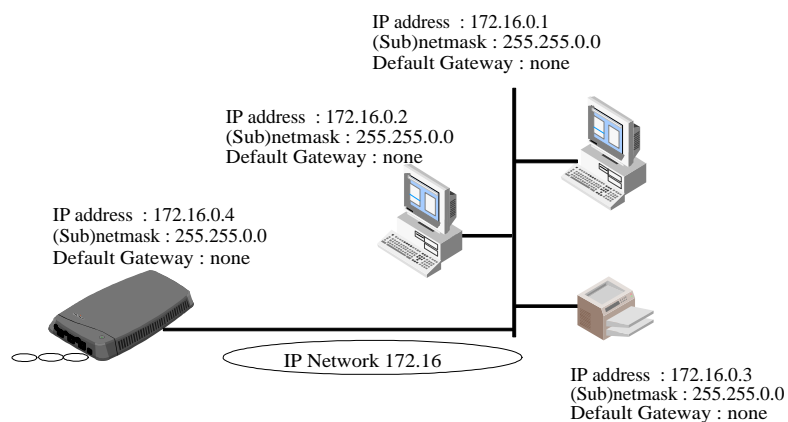


Figure 33. Example of Small Workgroup Configuration

Note:

In figure 33, the IP class B address is used (172.16.x.x.). The 10.x.x.x IP addresses could also be used.

If you have an existing workgroup, consider integrating the modem in this network. Simply change the IP address of the modem to a value that falls within the local network range.

Automatic IP Parameter Distribution

The modem can also operate in more advanced local networks that rely on a BOOTP server for centralized IP configuration.

The modem contains a BOOTP client that issues BOOTP requests during the first two minutes after power-up/reset. If a BOOTP server is present in the local network, it replies, and the modem acquires its IP parameters automatically.

The modem is compliant with RFC 951 Bootstrap Protocol and supports option 1 (Subnet Mask) and option 3 (Default Gateway) of RFC 2132 DHCP Options and BOOTP Vendor Extensions.

Note:

The modem also supports logical multi-homing; the default IP address, or the address you assigned yourself, remains usable even if the modem acquires parameters via BOOTP.

Advanced Networks

The modem supports tunneling at the user interface of a router. This advanced configuration requires a few special settings in the modem and the PCs in the network. An example configuration is shown in figure 34.

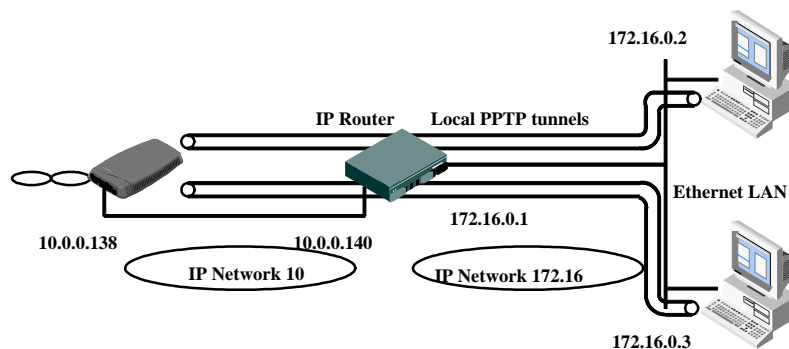


Figure 34. Example of Advanced Network Configuration

You must specify the default route for the modem. In this example, the IP address of the default router would be 10.0.0.140, which is the IP address of the Ethernet interface of the router connected to the modem.

For each PC you must add a route to the internal routing table. This route must point to the modem. For PCs equipped with the Windows 95 operating system, the procedure follows.

1. Select **Start** from the Windows 95 taskbar.
2. Select **Programs**.
3. Select **MS-DOS** prompt.
4. In the DOS window, execute the following command:

route add <Destination address> <Gateway address>

For example: **route add 10.0.0.140 172.16.0.1**

To verify the IP connection, you can ping the modem. If the modem responds, you can set up tunnels.

Ping-of-Life Procedure

If the local IP connection cannot be established because of a configuration error or because the configured IP address of the modem is forgotten, you can use the Ping-of-Life procedure to restore the connection. A special ping packet delivers a new IP address to the modem.

To restore the local connection to the modem, you must do the following:

- Preconfigure the new IP address in the ARP cache of one of your systems.
- Reset the modem and allow the selftest to end (takes about 30 seconds).
- Ping the new IP address within 60 seconds after the end of the selftest.

Note:

Most TCP / IP packages support the ARP and PING command.

The procedure for Windows 95 is described below. There might be small differences in other operating systems.

1. Select Start from the Windows 95 taskbar.
2. Select Programs.
3. Select MS-DOS prompt.
4. In the DOS window, enter the following command:

arp -a -N <interface IP address>

Note:

The <interface IP address> is the IP address of the interface to which the modem is connected.

For example: **arp -a -N 138.203.5.172**

Example of response:

```
Interface: 138.203.5.172 on Interface 2
Internet Address Physical Address Type
138.203.4.76 08-00-20-83-b7-26 dynamic
```

5. Add a static entry to the ARP table:

arp -s <modem IP address> 01-90-D0-80-01-01 -N <interface IP address>

Note:

The <modem IP address> is a placeholder for the IP address to be assigned. In the following example, 10.0.0.145 will be used. MAC address 01-90-D0-80-01-01 is a special MAC Group address from Alcatel to which the modem will respond.

6. You can verify if this step was successful by executing the arp command a second time:

arp -a -N <interface IP address>

```
Interface: 138.203.5.172 on Interface 2
Internet Address Physical Address Type
10.0.0.145 01-90-d0-00-00-20 static
```

7. Switch off the modem.

8. Switch on the modem and wait 30 seconds to allow the selftest to end.

9. Ping the IP address you just entered in the ARP cache:

ping 10.0.0.145

```
Pinging 10.0.0.145 with 32 bytes of data:
Reply from 10.0.0.145...
```

```
Ping statistics for 10.0.0.138:
Packets: Sent=4, Received=4, Lost=0
```

Note:

This response indicates that the modem has accepted its new IP address.

10. Clear the entry in the ARP cache as follows:

arp -d <modem IP address> -N <interface IP address>

Note:

You may also leave the entry in the ARP cache; it does not affect modem operation.

Note:

The modem and the PC must be in the same IP (sub)network. Otherwise, the ping is issued with the MAC address of the default router.

Ping-to-Defaults Procedure

If the modem configuration is incorrect, the Ping-to-Defaults procedure can be used to restore default settings.

The technique is identical to that used for the Ping-of-Life procedure, except that a different MAC address (01-90-D0-00-01-FF) is used.

Execute the following steps to reset the modem to its default settings:

1. Add the following to the arp cache:

arp -a <any IP address> 01-90-D0-00-01-FF

2. Reset the modem and wait for the self test to end.
3. Ping the IP address:

ping <any IP address>

Note:

Using the Ping-to-Defaults procedure overwrites previously configured modem settings.

CHANGING THE MODEM SETTINGS

This section describes how to access the high speed modem to configure operating parameters. The Alcatel 1000 high speed modem is already configured with default parameters and may not require adjustment.

Configuring the Browser

Web browsers can be configured to connect to the Internet directly or via a Proxy Server. To find out if you are using a proxy server, check the preferences of your browser.

If you want to change the ADSL modem settings, make sure your browser is not using a proxy server. The procedure to disable proxy settings depends on the browser you are using.

Note:

After configuring the ADSL modem, return the browser to its original settings.

Netscape Navigator

1. Select **Edit** pull-down menu, then select **Preferences**.
2. In the **Category** box, select **Advanced, Proxies**.
3. Activate the radio button, **Direct Connection to the Internet**.

Microsoft Explorer

1. Select **Internet** icon and click the right mouse button.
2. From the pop-up menu, select **Properties**.
3. Remove the tick mark from **Use Proxy Server** check box.

Accessing the ADSL Modem Interface

Access the ADSL modem interface as follows:

1. Start the web browser on your PC or workstation.
2. Enter the IP address of the ADSL modem in the URL field:

http://10.0.0.138

Note:

*The modem's default IP address is **10.0.0.138**.*

The welcome page appears. The modem now operates as a web server, displaying additional pages when you click on their links. Each page provides fields for entering operating parameters for your configuration.

Appearing on most of the pages are the following buttons:

Apply

Clicking this button activates the settings you have entered. Because the settings are stored in volatile memory, they will be lost if you turn off the modem or if the modem resets.

Save

Clicking this button saves the settings you have entered in nonvolatile memory. The settings remain active even if the modem is turned off or resets.

Defaults

If you have accidentally deleted parameters, this button allows you to recall the default settings. You must click Save if you want to make the default settings persistent.

Advanced

Clicking this button provides access to more advanced operating parameters.

Home

Click this button to return to the welcome page.

Back

Click this button to access the previous page.

Welcome Page

The welcome page provides the following buttons:

Initial Setup

Click this button to access the basic configuration page for adapting internal modem settings to your local networking requirements.

Bridge

Click this button to configure parameters for Ethernet LAN bridging.

PPP/PPTP

Click this button to configure parameters for Point-to-Point Protocol (PPP) relaying. Point-to-Point Tunneling Protocol (PPTP) is used to implement PPP through the modem Ethernet port.

System Overview

Click this button to display all modem connections and their settings.

Basic Configuration

When you click **Initial Setup** from the welcome page, you access the basic configuration page.

Numerous functions in the modem rely on Internet Protocol (IP) for their operation. IP requires a minimum set of parameters:

- IP address
- Netmask
- Default Gateway

These IP parameters are for local communication only (between workstations in your own local network and the ADSL modem). A second IP parameter set (via PPP/PPTP) is negotiated between the PC(s) and a remote site. The second IP set is not visible to you and does not interfere with the local IP configuration.

These parameters can be configured manually by entering values in the User Defined Configuration Table or automatically by enabling the BOOTP/DHCP Configuration Table.

Because the Alcatel 1000 ADSL modem supports multihoming (one interface supporting multiple IP addresses), the manually configured IP address and the automatically acquired IP address are active simultaneously.

The MAC address of the modem's Ethernet interface is displayed under the header of the basic configuration page.

The following parameters are available on this page:

User Defined Configuration Table

An example of the User Defined Configuration Table is shown in figure 35.

User defined configuration	
<input checked="" type="checkbox"/>	Enable/Disable IP address: <input type="text" value="10.0.0.138"/> Subnetmask: <input type="text" value="255.0.0.0"/> Default Gateway: DHCP/BOOTP

Figure 35. User Defined Configuration Table

Enable/Disable

Click this check box to enable or disable the user defined settings.

IP Address

In this field, you can change the user defined IP address of the modem to a value more suitable to your local IP address policy.

Note:

The modem comes with the default IP address of 10.0.0.138, which belongs to the class A private address range.

Netmask/Subnet Mask

This field represents the default netmask associated with the particular class of IP address you assigned to the modem. Leave this field unchanged if no subnetting is applied in your local network.

The modem automatically supplies the default netmask for the particular IP address class; for example, 255.0.0.0 for the preconfigured IP address. If you want to apply subnetting in your local network, extend the subnet mask with additional bits.

Default Gateway

If you want to use the modem in a more advanced local network, you can supply the IP address of your local default gateway. For standard applications with the modem connected to multiple PCs or workstations through a multiport hub, leave this field empty.

BOOTP/DHCP Configuration Table

The BOOTP configuration is enabled by default. If your network has an active BOOTP/DHCP server, the modem obtains its IP parameters automatically during the first 120 seconds after being switched on.

An example of the BOOTP/DHCP Configuration table is shown in figure 36.

BOOTP/DHCP Configuration	
<input checked="" type="checkbox"/>	Enable/Disable
	IP address: none
	Subnetmask: none
	Default Gateway: none

Figure 36. BOOTP/DHCP Configuration Table

Enable/Disable

Click this box to enable/disable the BOOTP/DHCP IP settings.

IP Address

If you enabled the BOOTP client in the modem, this field shows the IP address assigned to the modem by the BOOTP/DHCP server.

Subnet Mask

If you enabled the BOOTP client in the modem, this field shows the subnet mask assigned to the modem by the BOOTP/DHCP server. If the server did not distribute a subnet mask, the modem automatically supplies the default netmask for the IP address.

Default Gateway

If you enabled the BOOTP client in the modem, this field shows the default gateway supplied to the modem. If the server did not distribute a default gateway, the field is set to none.

The modem can operate with multiple IP addresses (multi-homing), but there can be only one active default gateway. If BOOTP/DHCP is enabled, the default gateway supplied in the User Defined Configuration Table is automatically disabled. Even if no default gateway is supplied by the BOOTP/DHCP server, the default gateway entry in User Defined Configuration Table is not used.

Advanced Configuration

This page allows you to configure settings for very specific IP configurations.

IP Address Table

This table summarizes all IP addresses configured in the modem. It also provides the IP address used for the loopback. An example of the IP Address Table is shown in figure 37.

Intf	Address	Netmask	Type	Action
Ethernet	10.0.0.138	255.0.0.0	User Defined	Delete
Loopback	127.0.0.1	255.0.0.0	Automatic	None
Use input fields below to add entry				
Ethernet	<input type="text"/>	<input type="text"/>	Additional	Add

Figure 37. IP Address Table

Intf

This field indicates the interface to which IP parameters are assigned. It can accept two values: Ethernet and Loopback.

Address

This field indicates the IP address of the interface.

Netmask

If available, this field indicates the subnet mask of the interface.

Type

This field indicates the origin of the IP parameters and can accept three values:

- User Defined - parameters entered manually through User Defined Configuration Table

- Automatic - parameters acquired automatically through BOOTP/DHCP Configuration Table
- Additional - parameters added via IP Address Table

Action

This field allows you to delete or add a parameter set.

IP Route Table

The modem can be configured to reach workstations in networks outside of its own local network. This is done by adding specific routes in the IP Route Table (figure 38).

Destination	Gateway	Mask	Intf	Action
Use input fields below to add entry				
<input type="text"/>	<input type="text"/>	<input type="text"/>	-	Add

Figure 38. IP Route Table

Note:

Most IP hosts display routing entries for every configured IP address. The ADSL modem displays only specific routes in this table.

To add a route to the routing table, use the bottom row of the table. Enter values for destination, gateway, mask, and interface. Use the Action field to add or delete an entry.

Bridge Configuration

The modem has an IEEE 802.1D compliant databridge that can be preconfigured from this page. Normally, the bridge does not need to be preconfigured for proper operation because it is a plug and play device.

If problems occur, you can easily change the default settings according to information supplied by the ISP or corporate network administrator.

Port States Table

Figure 39 shows an example of the **Port States** Table.

Bridge Port	Encap	FCS	VPI	VCI	State	Action
Use input fields below to add entry						
-	LLCSNAP	NO	8		-	Add

Figure 39. Port States Table

The fields of the Port States Table are described next.

Bridge Port

One of the characteristics of a databridge is the number of ports it supports. A bridge port is the logical equivalent of an interface. By default, the ADSL modem supports one local port (Ethernet interface) and four remote ports. The remote ports are mapped on the virtual ATM connections of the ADSL line. Only the remote ports are displayed in the table and are indicated as ADSL Port 0, 1, 2, and 3.

Encap

This field indicates the encapsulation of Ethernet or IEEE 802.3 frames to AAL5/ATM protocol.

The ADSL modem supports both the LLC/SNAP method and the VC MUX method for bridged Ethernet V2.0/IEEE 802.3 PDUs. By default, this field is set to LLC/SNAP, and the access server of the ISP or corporate network must use the same method. If it does not, contact the ISP or corporate network administrator.

FCS

This field indicates whether the last four bytes of the MAC frames are preserved or not. By default, the FCS of a MAC frame is not preserved and is set to NO. If the ISP or corporate network requires the FCS to be preserved over the ADSL connection, enter YES in this field.

VPI/VCI

VPI and VCI values identify an ATM virtual connection. Because the modem comes with preconfigured VPI/VCI values, you do not have to configure these fields.

However, if the ISP or corporate network administrator require VPI/VCI values different from the default values, you must enter these specific values in this field.

State

This field allows you to change the state of the individual remote ports. By default, only two ports (one local port and one virtual port) are in the forwarding state, meaning traffic can pass through them. The other ports can be enabled, if required, by placing them in the Enabled state.

Action

This field provides action buttons to add or delete bridge ports. The maximum number of remote bridge ports is four.

Deleting bridge ports might be useful if you want to use more than the eight PPP/PPTP ATM connections available by default.

Aging Table

This table allows you to alter, if necessary, the aging timer of the bridge internal database. Only in exceptional cases should you modify the default value of 300 seconds (five minutes). The allowed range is from 10 seconds to 12 days, which complies with the IEEE 802.1D bridging standard.

The Aging Table is shown in figure 40.

300	Seconds
-----	---------

Figure 40. Aging Table

Basic PPP/PPTP Configuration

The PPTP configuration page provides a PPTP Destination Table for PPP/PPTP connection information (see example in figure 41).

Channel ID	Name	State
0	ISP1	IDLE
1	ISP1	IDLE
2	ISP1	IDLE
3	ISP1	IDLE
4	ISP2	IDLE
5	ISP2	IDLE
6	ISP2	IDLE

Figure 41. PPTP Destination Table

The fields of this table are described next.

Channel ID

The numbers displayed in this column are the ATM Virtual Channels on the ADSL line. Using one of these numbers in the PPTP Connection Icon on your PC desktop allows you to select a specific remote destination.

Name

The values displayed in this column are customized entries reflecting the name of the ISP or corporate network connected to this virtual channel. You can use this name in the PPTP Connection Icon on your PC desktop.

State

The ADSL modem allows multiple users to connect to different remote sites simultaneously. When a connection is no longer available to other users, the state changes from *IDLE* to *In Use*. The IP address of the PC currently using the connection is also displayed.

Advanced PPP/PPTP Configuration

This page contains the PPTP Connection table. It provides a more detailed listing of PPP/PPTP connections and configuration information (figure 42).

Channel ID	Name	VPI	VCI	Encap	HDLC framing	State
0	ISP1	8	67	VCMUX	keep	IDLE
1	ISP1	8	75	VCMUX	never	IDLE
2	ISP1	8	83	VCMUX	never	IDLE
3	ISP1	8	91	VCMUX	never	IDLE
4	ISP2	8	99	VCMUX	never	IDLE
5	ISP2	8	107	VCMUX	never	IDLE
6	ISP2	8	115	VCMUX	never	IDLE

Figure 42. PPTP Destination Table

The additional columns provided in this table are described next.

VPI/VCI

VPI and VCI values identify an ATM virtual connection. Because the modem comes with preconfigured VPI/VCI values, you do not have to configure these fields.

However, if the ISP or corporate network administrator requires VPI/VCI values different from the default values, you must enter those values in these fields.

Encap

This field indicates the encapsulation of Ethernet or IEEE 802.3 frames to AAL5/ATM protocol.

The ADSL modem supports both the LLC/NLPID method and the VC MUX method for bridged Ethernet V2.0/IEEE 802.3 PDUs. By default, this field is set to LLC/NLPID, and the access server of the ISP or corporate network must use the same method. If it does not, contact the ISP or corporate network administrator.

HDLC Framing

PPP packets arriving via a PPTP tunnel and PPP packets encapsulated on ATM connections differ in format. The PPP format on AAL5 is shown in figure 43.

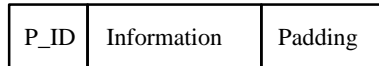


Figure 43. PPP ATM Format

The PPP format within a tunnel is shown in figure 44. This format has two additional bytes (FF and 03) in front of the packet, inherited from another encapsulation method (PPP in HDLC-like framing).

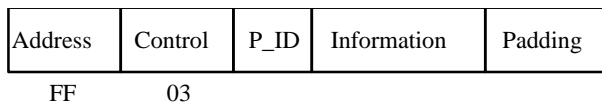


Figure 44. PPP/PPTP Tunnel Format

The ADSL modem adapts to the different formats based on the connection type. If problems with operation occur, the modem can be configured to handle the differing formats as follows:

- When you set this field to **never**, the modem ensures that FF-03 is *never* placed in front of a PPP packet encapsulated on an AAL5/ATM connection. This is the default setting.
- When you set this field to **always**, the modem ensures that FF-03 is *always* in front of a PPP packet encapsulated on an AAL5/ATM connection. Although not standard, some equipment may rely on this format.
- When you set this field to **keep**, the modem does not alter the PPP packet arriving via a tunnel; it *keeps* the two bytes in front of the PPP packet when it performs the encapsulation.

System Overview Page

This page provides an instant overview of all ADSL channels on the ADSL modem. It is a summary of the information provided on the Bridge page and the PPP/PPTP page.

REGULATORY INFORMATION

Environmental Conditions

- The equipment may not be mounted at a location exposed to solar and/or heat radiation.
- The equipment must be mounted in normal living or working areas with a minimum ambient temperature of -5°C (23°F) in steady state conditions.
- The equipment may not be subjected to water (even from other sources than rain and icing) and no condensation is allowed.
- The maximum ambient temperature may not exceed 40°C (104°F) external to the housing.

Safety Standards

The ADSL high speed modem is compliant with UL 1950.

Power Supply

The ADSL high speed modem is equipped with an external power supply adapter of 120 VAC/60 Hz converting to 9 VDC/1A unregulated output voltage.

The supplied adapter has the following output specifications:

- 9 VDC unregulated output voltage,
- Maximum 1A output current,
- Maximum 860 mV_{eff} ripple voltage, and a
- Limited power source (according to IEC/EN 60950, subclause 2.11).

Conformance Declarations**FCC Declaration of Conformity**

Manufacturer's Name	(Alcatel) also d.b.a. Alcatel Network Systems, Inc. 2912 Wake Forest Road Raleigh, NC 27609-7860 USA 919-850-6000
Name of Equipment	A1000 ADSL ANT (ADSL Network Terminator)
Model of Equipment	3EC18200, 3EC18201, 3EC18202
Type of Equipment	Information Technology Equipment
Class of Equipment	Class B
Application of Regulations	FCC Title 47 CFR, Part 15 Subpart B, DoC
Standard(s) to which Conformity is Declared	ANSI C63.4:1992
Measurement Technical Report Number	0214ALC1

I the undersigned, hereby declare that the equipment specified above complies with the essential emission requirements of the stated Application of Regulations.

Manufacture's
Signature
Full Name


M. Niel Ransom

Date
Position


V.P. & GM- ANS/ASD

Interference Information Part 15 of FCC Rules

Your Alcatel product has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

If your Alcatel product causes interference to radio or television reception when it is in use, you might correct the interference with any one or all of these measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.

Modifications to this product not expressly approved by Alcatel could void the user's authority to operate the equipment.

For Canadian Modem Users

NOTICE: The Industry Canada (IC) label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operational, and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single-line, individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION:

Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Pour les Utilisateurs Canadiens de Modem

AVIS: L'étiquette d'Industrie Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme à certaines normes de protection, d'exploitation et de sécurité des réseaux de télécommunications. Toutefois, le Ministère n'assure pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit assurer qu'il soit permis de le raccorder aux installations de l'entreprise locale de télécommunications. Le matériel doit également être installé en suivant une méthode de raccordement acceptée. Dans certains cas, les fils intérieurs de l'entreprise utilisés pour un service individuel à ligne unique peuvent être prolongés au moyen d'un dispositif de raccordement homologué (cordon rallonge téléphonique interne). L'abonné ne doit pas oublier qu'il est possible que la conformité aux conditions énoncées ci-dessus n'empêche pas la dégradation du service dans certaines situations. Actuellement, les entreprises de télécommunication ne permettent pas que l'on raccorde leur matériel à des jacks d'abonné, sauf dans les cas précis prévus par les tarifs particuliers de ces entreprises.

Les réparations de matériel homologué doivent être effectuées par un centre d'entretien canadien autorisé désigné par le fournisseur. La compagnie de télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur, ou à cause de mauvais fonctionnement.

Pour sa propre protection, l'utilisateur doit assurer que tous les fils de mise à la terre de la source d'énergie électrique, des lignes téléphoniques et des canalisations d'eau métalliques, s'il y en a, soient raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales.

AVERTISSEMENT:

L'utilisateur ne doit pas tenter de faire ces raccordements lui-même; il doit avoir recours aux services d'un électricien.

TROUBLESHOOTING TIPS

Problem	Solution
ADSL modem does not work (visual indicators do not light)	Verify that the ADSL modem is plugged into an electrical outlet.
	Verify that the power switch on the ADSL modem is turned on.
ATMF connection does not work	Verify that the cable is securely connected to the ATMF-25 connector.
Ethernet connection does not work	Verify that the cable is securely connected to the 10BASE-T connector and that the correct cable type for Ethernet equipment is being used.
Poor ADSL modem performance	Verify that the ADSL modem is installed as described in instructions in this user's guide.
	Verify that the ADSL modem has adequate ventilation. Place the modem on an even, hard surface. Do not stack books or paper on the modem.
	Verify that in-house wiring is routed away from possible sources of interference, such as electrical wiring.
Power/Sync LED is solid green, but no traffic is passing through	Turn the ADSL modem off and on again.
Power/Sync LED remains solid red	Turn the ADSL modem off and on again. If problem remains, contact the service provider.

If the troubleshooting tips do not resolve the problem, contact the service provider for assistance.



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